VOL. VI.

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MISCELLANEOUS COLLECTIONS.

VOL. VI.

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JOSEPH HENRY,
Secretary S. I.

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

MONOGRAPHS

OF THE

DIPTERA

OF

NORTH AMERICA.

BIBLIOTECA NAZIONALE V. E. III - NAPOLI

PREPARED FOR THE SMITHSONIAN INSTITUTION

BY

H. LOEW.

PART I.

EDITED, WITH ADDITIONS,

BY

R. OSTEN SACKEN.

WASHINGTON:
SMITHSONIAN INSTITUTION.
APRIL, 1862.

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ADVERTISEMENT.

The present publication is the first part of a work on North American Diptera in process of preparation by Dr. H. Loew, of Meseritz, Prussia (one of the highest living authorities on the subject), undertaken at the especial request of the Smithsonian Institution. The materials have been derived principally from the collection of Baron R. Osten Sacken, of the Russian Legation in Washington, kindly intrusted to the author for examination.

As explained by Dr. Loew, the work will appear in monographs of genera and families, sufficient materials being at hand for illustrating particular groups only, without relation to their systematic sequence.

The Institution is under obligations to Baron Osten Sacken for editing the work, adding species described by Dr. Loew subsequent to the reception of his manuscript, and for correcting the proofs. He has also added a monograph of the *Cecidomyidæ*, a group of much interest, and one to which it was considered of importance to call the early attention of investigators.

JOSEPH HENRY,
Secretary S. I.

Smithsonian Institution,
Washington, March, 1862.

ACCEPTED FOR PUBLICATION, JULY, 1861.

PHILADELPHIA:
COLLINS, PRINTER.

PREFACE.

THE impulse to write on North American Diptera was given to me by Baron Osten-Sacken, who, first by sending me rich collections of such Diptera and finally by intrusting me with the greatest part of his own Diptera collected in North America, has enabled me to undertake this task, and, I hope, with some success. If my observations had been written in German, and published in any of our German Transactions, I should have had good reason to fear that the results would not become sufficiently known in North America, and would at all events be longer in obtaining access there. I resolved, therefore, to give them in English, and the Smithsonian Institution in Washington has added to the many proofs it has already given of an energetic furtherance of any studies relative to the natural history of North America, the liberal resolution to print my paper on North American Diptera at its own expense. If these papers, according to my intention, contribute to the increase of the study of this interesting order of insects, the principal thanks are due to the Institution and to Baron Osten-Sacken. As for the English text, I use, it is true, the assistance and advice of a friend who is well acquainted with the English language; should, nevertheless, some roughness occur, I beg that it may be attributed to some supplementary alterations of my own, which circumstances prevented me from submitting to him. I hope that shortcomings of this kind will be kindly overlooked, provided my descriptions be not deficient in precision and clearness. As I do not wish to remain the sole describer of N. A. Diptera, but hope soon to have many fellow-laborers, I take the liberty of pointing out briefly what, in my opinion, should be chiefly borne in mind in making and publishing such descriptions. Without any disposition to find fault with others, I believe I may be permitted some remarks, since for the last twenty years I have been occupied with the study of Diptera, and have been obliged to spend many hours in identifying (how often fruitlessly!) the published descriptions. What renders the identification of a very great number of the existing descriptions so very difficult, is the inexactness of the system used. For however natural the axiom may appear, that a new species is only to be located in the genus to which it really belongs, it is so little respected by most dipterological writers, that a long list could be made out of the instances in which they have sinned against it; indeed the number of cases, in which a new species has been placed in a wrong family, is not small. It is not even always sufficient to place it in the right genus, for as soon as this genus is at all numerous in species, or the species are difficult to distinguish, the peculiar group of the genus to which the new species belongs should be pointed out, and if among the species already well known there are any very similar to those described, they ought of necessity to be specially mentioned. Consequently only those entomologists will publish new Diptera with success, who are completely acquainted with the system of this order of insects, whereas he who has a defective knowledge of it, far from advancing science, lays impediments in its way. The first task, then, for those who intend to come forth with satisfactory papers on the field of Dipterology, will of course be to acquire a most complete and sure knowledge of the system.

As an introduction to the following essays of a more monographic character, will be found a short sketch of the terminology of Diptera, as well as one of the dipterological system. The latter afforded me an opportunity of giving an outline of the North American dipterological fauna, as far as known to me at present. An elaborate classification, equally detailed in all its parts, would require not only a larger amount of materials than I have at my disposal, but also, in order to be intelligible, a considerable number of plates. I am compelled, therefore, to give up such an undertaking for the present, I hope, however, to be able to execute it at some future time. Although I trust that my short sketch will prove of some help to the student, by furnishing him occasionally a useful hint, or guiding him aright in general, it will be readily understood that in the prosecution of the study he will require more detailed information. I will, therefore, briefly indicate the works in which he may find it: Meigen's *Zweiflügelige Insecten* (7 vols.

8vo.) is still the best work, exhibiting the dipterological system. In order to obtain information on the progress which science has made since Meigen's age, this work may be followed by the study of Walker's *Diptera Britannica.* The excellent plates by Mr. Westwood, and the systematic arrangement prepared for the most part by Mr. Haliday, give to this work a value not shared by Mr. Walker's other publications. Next to these I would name Mr. Macquart's *Diptères Exotiques*, a work which, notwithstanding the errors in many of its figures and the carelessness of nearly all the descriptions, affords a great deal of useful information about the systematic arrangement of Diptera.

After having acquired a general knowledge of the system by the study of these three works (or, if not familiar with the German language, of the two latter only), the best plan will be to concentrate special study on one, or, at the utmost, on a few families of Diptera, and to consult the monographic papers relative to them, which are not difficult to procure, in order to obtain a complete and sure knowledge of characters within a more limited field. For even the smallest field will always be found wide enough to afford opportunities for the most interesting discoveries. This mode of obtaining a knowledge of the system capable of serving as a solid foundation to valuable publications is certainly a long and tedious one. It may be considerably facilitated, however, by the use of a well determined collection of typical specimens of all the families and genera, and it will afford me much pleasure to extend all assistance in my power to those who may prefer the latter course; for both my wish to become better acquainted with the Diptera of North America and their desire to study the system might well coincide to supply the wants of both parties.

I am always ready to send in exchange for well preserved N. A. Diptera forwarded to me (address Mr. H. Loew, Meseritz, Prussia) a reasonable equivalent in accurately named representatives of the genera. I should probably be obliged, in most cases, to send only European specimens, whereas, perhaps, it would seem more desirable to have N. A. species. But the number of species occurring in perfect identity both in Europe and North America is so surprisingly large, and, besides, there are so many N. A. species exceedingly resembling well-known European ones, that the best foundation for the study of N. A. Diptera would be a complete collection of European species. It will be very useful to both parties, if those who desire an exchange would remember that the smaller and smallest species possess the greatest interest for me, and if they would at the same time point out to me such families as they are chiefly desirous of knowing. Moreover, it will be necessary to agree about the way in which the equivalents might be forwarded. In case I receive no such direction, I shall suppose I am at liberty to send them by the kind intervention of the Smithsonian Institution at Washington, through which I beg all consignments intended for me may be forwarded.

I have no doubt as to a successful issue to my labors, if I continue to receive the same liberal and generous assistance from the Smithsonian Institution and from Baron Osten-Sacken which I have enjoyed from the beginning, especially if this commencement contributes to increase the number of those interested in the study, and ready to promote it by the communication of species taken by them, in the same way in which Messrs. Rob. Kennicott, S. H. Scudder, A. S. Packard, Edw. Norton, and others, have furnished materials for the excellent paper of Baron Osten-Sacken on the *Limnobidæ* of North America.

H. LOEW.

MESERITZ, 3 Oct. 1860.

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ON THE TERMINOLOGY OF DIPTERA.

DIPTERA have so much in common with other orders of insects that the terms applied to the latter, which I may consider as generally known, may frequently be used for the former. I have therefore merely to explain those terms which, on account of the peculiar organization of Diptera, are either applied solely to the insects of this order or are used in a more or less modified sense. It is well known, how little the various authors agree in the choice of these terms, and how many of them seem to find pleasure in departing as much as possible from the terms used by their predecessors. This is a great evil, aggravating the difficulty of understanding Dipterological publications, and impeding the progress of Dipterology. It would take too much space to explain all the terms used by different authors, and I confine myself to those only which seem the most necessary and which I have used in this publication. The following considerations have guided me in their choice. I think it a duty of a later author to accommodate himself to the usage of his predecessors, especially those who have written standard works, and at the same time to reconcile them as much as possible where they differ from each other. The indispensable innovations should be introduced only gradually and in conformity with the established usage, since in such matters an agreement about the terms chosen is more important than the mode of selecting them. Meigen, Wiedemann, and Fallen in earlier times, Zetterstedt and Macquart more recently, have in that respect a claim to our attention. It has therefore been my object to assume the position of an arbiter between them, and to avoid such terms as depart entirely from the adopted usage, except in cases in which I might differ so much from my predecessors as to become unintelligible if restrained by their terminology.

The *head* has a hinder plane opposite to the thorax, called occiput (*occiput*); that region of it lying over the junction of the head is the nape (*cervix*). The part of the head which reaches from the antennæ as far as the occiput and is limited laterally by the compound eyes, is the front (*frons*), the upper part of which is the crown (*vertex*), the limit between the front and the occiput having the name of vertical margin (*margo verticalis*). The middle of the front being often of a more membranaceous substance and sometimes differing in color from its borders, is called the frontal stripe (*vitta frontalis*). On the crown, there are the simple eyes (*ocelli*), being usually three in number and forming a triangle, sometimes on a sharply defined triangular space, the ocellar triangle (*triangulum ocellare*). Most of those Diptera which undergo their metamorphosis within the larva-skin possess, immediately above the antennæ, an arcuated impressed line, which seems to separate from the front a small piece usually of the form of a crescent, the frontal crescent (*lunula frontalis*). The impressed line itself, which continues over the face nearly as far as the border of the mouth, is called the frontal fissure (*fissura frontalis*). It owes its origin to a large bladder-like expansion which exists at this place in immature imagos, and which helps them in bursting the pupa case. The frontal fissure of course is the true anterior limit of the front, and the frontal crescent in fact belongs to the face; however, on account of its usual situation, it is commonly considered as a part of the front. In many genera the eyes of the males meet on the front, so as to divide it into two triangles, the superior of which is called the vertical triangle (*triangulum verticale*), the inferior the anterior frontal triangle (*triangulum frontale anterius*), or simply the frontal triangle (*triangulum frontale*). The anterior portion of the head reaching from the antennæ to the border of the mouth or oral margin (*peristomium*) is called the face (*facies*). In most Diptera it is divided into three parts adjoining each other, the limits of which depend on the situation which the frontal fissure, continued to the oral margin occupies in the developed imago; the form and mutual proportion in size of these parts are of the highest value in the classification and distinction of the species of Diptera. Beneath the antennæ there are in many Diptera longitudinal holes for their reception, the antennal furrows (*foveæ antennales*); the antennæ lie in them while the insect is still in the pupa case, sometimes even after its exclusion. That part of the head which lies on the side beneath the eyes is the cheek (*gena*).

The compound eyes are sometimes encompassed in a larger or smaller part of their circumference by a ring, somewhat swollen, and separated more or less distinctly from the remainder of the surface of the head; it is called the orbit (*orbita*), the successive parts of which may be called the anterior (*orbita anterior sive facialis*), inferior (*inferior s. genalis*), posterior (*posterior s. occipitalis*), superior (*superior s. verticalis*), and frontal (*frontalis*) orbits. An orbit is also often spoken of, where no ring is distinctly set off from the rest of the surface of the head; in this case a distinct color or some peculiar structure mark the nearest surroundings of the eyes.

The *oral parts* of Diptera, destined for sucking, are called the sucker or proboscis (*proboscis*). They are either inserted at the end of a more or less cylindrical prolongation of the head, called the snout (*rostrum*), or project from a wide aperture often occupying a great part of the under surface of the head, called the mouth hole (*cavitas oris*). The common, fleshy root of the oral parts is connected by a membrane with the border of the mouth. This membrane often has a fold, sometimes of a quite horny substance, and is then called the clypeus (*clypeus s. prælabrum*); it is either entirely concealed by the anterior border of the mouth and is then usually movable, or it projects over it as a ridge and is then usually immovable. The largest of the oral parts in most Diptera is the fleshy under lip (*labium*), consisting of the stem (*stipes*) and the knob (*capitulum labii*) formed by the two suctorial flaps (*labella*). Besides the under lip, the palpi (*palpi*) are most perceptible and must be noticed in the description of the species. The remaining oral parts are generally rather small and stunted, having the form of bristles or horny lancets; they are considered as being the tongue (*lingua*), under jaws (*maxillæ*), upper jaws (*mandibulæ*), and upper lip (*labrum*), the latter shutting the under lip from above. These parts are not easily applicable in distinguishing species.

The *thorax* of Diptera as well as that of other insects consists of three segments, the *prothorax*, the *mesothorax*, and *the metathorax*. But in the order of Diptera the development of the mesothorax exceeds so much that of the two other portions, that it forms by far the largest part of the whole thorax, and in the description of Diptera is exclusively designated with the latter name, while other names are given to the prothorax and metathorax, when some particular part of them is to be characterized. The prothorax being generally very little developed, sometimes forms a neck-like prolongation which bears the head, and is then called the neck (*collum*). Sometimes the fore corners of the mesothorax or the shoulders (*humeri*) are covered by a lobe of the prothorax (*lobus prothoracis humeralis*), distinctly separated from the mesothorax; but it is not unusual for this lobe to be so soldered to the mesothorax that it is not possible to discover a distinct limit between them, except in general, by their color or hairs; it is then called the shoulder callosity (*callus humeralis*). The prothorax sometimes also applies closely to the anterior border of the mesothorax, and has then the name of collar (*collare*). The mesothorax frequently has a transverse furrow (*sutura transversalis*) crossing the middle of its upper side and ending on each side a little before the base of the wing; its presence or absence as well as its form furnishes characters important in the classification of Diptera. On each side of the breast—the breast side (*pleura*)—there is beneath the shoulder a spiracle (*stigma prothoracis*) still belonging to the prothorax. To the back of the mesothorax applies the scutcheon (*scutellum*), separated from it by a furrow. Beneath the scutellum a part of the metathorax is to be seen, called *metanotum*, generally descending obliquely, often very convex, and on each side with a more or less inflated space, called the lateral callosity of the metanotum (*callus metanoti lateralis*). The poisers (*halteres*) have their origin beneath this callosity, and before either of them we see the spiracle of the metathorax (*stigma metathoracis*). The membranous covers which in many Diptera are found above this spiracle, have the name of covering scales (*tegulæ*).*

The *abdomen* is the third of the three principal parts of the body, but we usually so call its upper side only, the name of belly (*venter*) being given to the under side. The segments of the abdomen are of course, as in the other orders of insects, counted from the front to the back; but the anterior ones are often soldered together, while the posterior ones are stunted, and by their concealed situation withdrawn from the eye; much caution is therefore required in counting them. The statements about their number are frequently rather arbitrary and conventional, and often require an explanation. At the end of the abdomen we see in the male the appendages destined to take hold of the female in the copula

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* Some authors call them *squamæ*.—O. S.

(*hypopygium*), in the female the organ for laying the eggs (*ovipositor*); the former, if they have the form of pincers and are not bent under the belly, are called the pincers (*forceps*), the latter according to its form either the borer (*terebra*) or the style (*stylus*). Both organs are of the greatest importance in the distinction of species in many families, and their structure being generally very complicated and varying much in different families, deserves a most attentive study.

The *neuration of the wings* of Diptera forms so essential a foundation of their systematical arrangement and is so useful for the distinction of species, that its thorough knowledge and a scrupulous and accurate denomination of its single parts and of their mutual arrangement is quite indispensable. Our first and most important task will be to ascertain which parts of the neuration of the wings correspond to each other in the different families, since this is the only way to obtain a terminology in which corresponding things are designated by the same names, and which, therefore, is not liable to misinterpretation.

At a first and superficial glance, the neuration of the wings shows so different a structure in the various families of Diptera, that it seems impossible to reduce it to a common type. But, on a closer examination, we find that we can make out without much difficulty a common type existing in its greatest simplicity and plainness in the *Muscidæ*. The framework of the whole neuration of the wings is formed by the longitudinal veins (*venæ longitudinales*), which are connected with each other by the transverse veins (*venæ transversæ s. venulæ*). The longitudinal veins spring from four trunks, issuing from the base of the wings; the first and fourth trunks being the least developed, the second and third must be taken for the main trunks, and consequently the longitudinal veins originating from them, for the main longitudinal veins of the wing. To the anterior of these two main trunks belong three longitudinal veins, the foremost of which runs first parallel to the anterior border of the wing and joins it at a greater or less distance from the tip of the wing; it is called the first longitudinal vein (*vena longitudinales prima*). The second longitudinal vein proceeds from the first generally before the middle of the wing, and reaches the anterior border of the wing nearer to the tip. In a similar way the third longitudinal vein has, again, its origin from the second. To the second main trunk also belong three longitudinal veins, which are counted from the front to the back, and are called the fourth, fifth, and sixth longitudinal veins. The hindmost vein of the anterior main trunk and the foremost vein of the posterior main trunk, *i. e.* the third and fourth longitudinal veins, are connected by a transverse vein situated about the middle of the wing and called the small or middle transverse vein (*vena transversa minor s. media*). Using this transverse vein as a starting-point, we cannot easily have any doubt about the position of each of these six main longitudinal veins.

The remaining neuration takes place in the following way: The first of the four trunks emits a usually rather stout vein, forming the anterior border of the wing; it either runs round the whole border of the wing, attenuating a little towards its end, and is called the marginal vein (*vena marginalis*), or it only reaches as far as the fourth or third, sometimes even the second or first longitudinal veins, and is then generally called the costal vein (*vena costalis s. costa*); both these expressions can be used as identical without any fear of incorrectness. The costal vein is sometimes interrupted in one or more places, thus forming a number of successive portions, a structure most characteristic in several families. Besides this vein, a second one proceeds from the foremost of the four trunks, which, from its being frequently absent, is not counted with the other longitudinal veins, but is called the auxiliary vein (*vena auxiliaris*); not far from its base, it is connected by the transverse shoulder vein (*vena transversa humeralis*) with the costal vein. A total or partial absence of the auxiliary vein, its structure, and the peculiarities of situation which it has relatively to the first longitudinal vein, are very characteristic marks for the distinction of families and genera.

The first and second longitudinal veins are usually simple, the third being frequently forked; this furcation arises from its emitting beyond the small transverse vein an anterior branch, which generally runs to the border of the wing between the second and third longitudinal veins, and is therefore called the anterior branch of the third longitudinal vein. Both branches together form the fork of the third longitudinal vein, and that part of this vein which lies between the small transverse vein and the point of forking of both branches is called the handle (*pedunculus*) of this fork. Sometimes the foremost branch of the third longitudinal vein is connected with the second longitudinal vein by a transverse vein, or it runs into the second longitudinal vein instead of running to the border of the wing, and thus has the appearance of a transverse vein.

In most Diptera there is no other connection between the third and fourth longitudinal veins except the small transverse vein, and we can cross the wing between the third and fourth longitudinal veins in its whole length without meeting another vein but the small transverse vein. But in some families the fourth longitudinal vein, abandoning towards its end its former direction, turns to the third longitudinal vein and reaches it either at its end or a little before it, constituting thus a second connection: there is a rarer case when that connection is effected by a transverse vein placed distinctly on the fourth longitudinal vein. A third connection between the fourth longitudinal vein and the anterior main trunk is formed in some families in the neighborhood of the base of the wing; often there is only a transverse fold running obliquely from the fourth longitudinal vein to the first; in some families it incrassates into a transverse vein.

The three longitudinal veins belonging to the second main trunk usually begin to diverge quite near the base of the wing; the hindmost of them, *i. e.* the sixth longitudinal vein, is often distinctly seen as the continuation of the common trunk, while the two anterior ones uniting with their bases seem to form a kind of loop which touches the main trunk only at one point. As frequently, the fifth longitudinal vein represents a distinct continuation of the main trunk; in some families all the three longitudinal veins appear in equal distinctness as its branches. Between the fourth and the fifth longitudinal veins there are in general two transverse veins, which divide the space of the wing, included by the fourth and fifth longitudinal veins, into three parts. The first of these transverse veins is the anterior basal transverse vein (*vena transversa basalis anterior s. venula basalis anterior*), the absence of which is characteristic for some families; the second is usually the longest transverse vein of the wing and is of the highest systematic value; it is called the posterior transverse vein (*vena transversa posterior s. venula posterior*). Not unfrequently another vein starts from its middle, running to the border of the wing; it cannot be considered as a longitudinal vein, and is called the anterior intercalary vein (*vena intercalaris anterior*). It must not be confounded with a branch emitted in some Diptera from the posterior side of the fourth longitudinal vein before its tip.

Near the base of the fifth longitudinal vein rises the posterior basal transverse vein (*vena transversa basalis posterior s. venula basalis posterior*), usually a short transverse vein, running to the sixth longitudinal vein, but frequently meeting it only in a later part of its course at a very acute angle, or even reaching the border of the wing, without having met that vein; in all these cases it divides all the space of the wing lying between the fifth and sixth longitudinal veins into two parts. In several families there is, immediately beyond this transverse vein, another vein, the posterior intercalary vein (*vena intercalaris posterior*), which proceeds from the fifth longitudinal vein and runs to the border of the wing; sometimes it meets the fifth longitudinal vein before reaching the border.

In that part of the wing which is behind the sixth longitudinal vein, are spread the branches of the hindmost of the four trunks; it is entirely wanting in many Diptera, and exists in most of them only in a rudimentary state; therefore generally only one branch, or at the utmost two weak ones, not reaching the border of the wing, are perceptible; they are called the axillary veins (*venæ axillares*). Where the hindmost trunk is well developed, these veins become complete longitudinal veins; they best preserve the same name, but may be numbered as the seventh, and, where two exist, as the seventh and eighth longitudinal veins without any fear of misinterpretation. In the case of such a great development of this trunk, the foremost of the veins belonging to it is generally connected near its base with the sixth longitudinal vein by a transverse vein.

It results, from the foregoing exposition, that the anterior part of the wing is divided by the three longitudinal veins belonging to the anterior main trunk, and the posterior by the three longitudinal veins belonging to the posterior main trunk, each into three sections, an exterior one, a middle, and an interior one, while the three sections of the anterior part of the wing are separated from those of the posterior part by a middle stripe or band which extends from the base of the wing to its tip. It would be an easy task to invent fit names for these principal parts of the surface of the wing, from which convenient expressions would result for their single parts or the cells of the wings. But it seems to me that the introduction of such a new nomenclature would hardly promote our principal end, the agreement of authors in the use of terminological expressions, since it is not so much the nature of the received terms as the consent in their application which we must aim at. I therefore think it most advisable to retain such names for the denomination of the wing-cells, as are already in general use. But in adopting these names I cannot but mention that many of them do not seem to be well chosen, and that I accept them only with the intention of bringing about a terminology generally agreed upon.

I shall, therefore, call the cells belonging to the first section of the wing the costal cells (*cellulæ costales*), those of the second the marginal cells (*cellulæ marginales*), and those of the third the submarginal cells (*cellulæ submarginales*). The latter are of the greatest importance for characterizing families and genera, as well as for the distiuction of species. When the second and third longitudinal veins are simple, and the third anterior section is consequently undivided, there exists only one submarginal cell; but when the third longitudinal vein has a branch running to the border of the wing, we count two such cells, an anterior and a posterior one; when the anterior branch of the third longitudinal vein is also connected with the second longitudinal vein by a transverse vein, the number of submarginal cells amounts to three, among which that, formed by the inner part of the anterior submarginal cell, is called the interior submarginal cell; when the anterior branch of the third longitudinal cell assumes the form of a transverse vein running to the second longitudinal vein, only an interior and an exterior submarginal cell are distinguished.

Among the existing names, none is well applicable as a common denomination either to the cells belonging to the middle of the wing or to those of each of the two first sections of the posterior part of the wing; I am compelled, therefore, though not without reluctance, to give up the application of such names. Among the cells of the portion just mentioned, there are three that have generally been too little noticed in the description of the neuration of the wing. Their different forms give very good characters, the more so as, on the whole, the differences, which the neuration shows in the neighborhood of the base and costal border, have always a higher systematic value than those occurring near the tip or the posterior border of the wing. Those three cells are placed nearest to the base of the wing; the first of them belongs to the middle of the wing, and reaches as far as the small transverse vein; the second belongs to the first section of the posterior part of the wing, and extends as far as the anterior basal transverse vein; the third belongs to the second section of the same part of the wing, and joins the posterior basal transverse vein. These three cells may, in general, be called the three basal cells (*cellulæ basales*). The foremost of them is generally much longer than the two others, a proportion which is usually indicated by the expression of "one large and two small basal cells;" against this mode of expression nothing can be objected, since it implies no uncertainty. It is, however, a little puzzling to invent a convenient term, when the posterior basal transverse vein, instead of running to the sixth longitudinal vein, assumes the character of a longitudinal vein, and runs to the border of the wing, so that the hindmost basal cell joins the border of the wing. Not only in this case, but also when the hindmost basal cell, though closed, is distinguished from the second basal cell by a much more considerable length, it is usually named the anal cell (*cellula analis*), and then, consequently, two basal cells are considered to be present. Badly chosen as the term "anal cell" may be, it is, nevertheless, so settled that it will be difficult to remove it by the introduction of a more convenient one. In certain families the great and very symmetrical development of the three basal cells is characteristic; they are then called the ternated cells (*cellulæ ternatæ*), which term, though expressive of the thing, seems to be superfluous. One of the most important cells is that belonging to the first section of the posterior part of the wing, and extending from the anterior basal transverse vein to the posterior transverse vein, and bearing the little transverse vein on its anterior margin; it is generally called the discoidal or discal cell (*cellula discoidalis*). When the anterior basal transverse vein is wanting, which is characteristic in many families and genera, this cell coalesces with the second basal cell, which then must be considered as a part of the discoidal cell; if the posterior transverse vein has disappeared, there is no discoidal cell at all. In those Diptera which possess the anterior intercalary vein, sometimes the part of the posterior transverse vein situated before or behind this intercalary vein is wanting, and in that case the existence of a discal cell is granted, which, in the former instance, is considered as anteriorly opened, in the latter, as posteriorly opened.

The second cell of the middle of the wing opening in its border, and those of the two first sections of the posterior part of the wing, are called the cells of the posterior margin, or posterior cells (*cellulæ posteriores*), and numbered as first, second, etc., beginning with that which belongs to the middle of the wing, and is limited at its base by the small transverse vein. It is evident that in all Diptera there are really only three posterior cells. They exist in their typical simple form in the *Muscidæ*. The first of them belongs to the middle of the wing, the two others to the first and second section of the posterior part of the wing. The first is usually subject to no partition, but is sometimes closed before reaching the border. The second is frequently divided in two portions by the presence of the anterior intercalary vein, and this happens whenever the fourth longitudinal vein emits a hind branch before its end; it even forms three portions when this branch exists along with the intercalary vein. In the genera having a posterior intercalary vein, a bipartition of the third posterior cell occurs. Though it would be very convenient to speak in all cases of only three such cells, and to point out in the way indicated the mode of their further partition, yet the ruling usage does not admit of this, but counts all these portions as successive posterior cells, whence their number sometimes amounts to six. When the second posterior cell and the discoidal cell are united in consequence of the absence of the posterior transverse vein, the cell formed in this way retains the name of second posterior cell.

The cells belonging to the third section of the posterior part of the wing are not, usually, completely separated from each other, and then are frequently termed the false cells (*cellulæ spuriæ*); a better term for them might be that of axillary cells (*cellulæ axillares*). They are numbered in the direction from the sixth longitudinal vein towards the posterior angle of the wing.

As for the expressions *costal border, tip, posterior border, posterior* or *anal angle* of the wing, they are understood by everybody. The posterior angle is terminated by the axillary incision (*incisura axillaris*) towards the base of the wing. The wings of many Diptera are provided with a lobiform appendage, the alar appendage (*alula*), reaching from the axillary incision to the innermost base; it must not be confounded with the covering scale that lies above the poisers, and which has often been called by the same name.

In order to understand a very intricate neuration and reduce it to the simple type, we must take care not to assume for parts of the same main vein all those ramifications which run in one direc-

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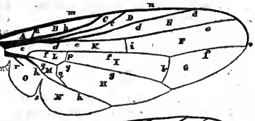
tion. As threads loosely drawn up in a frame, when strongly strained by transverse threads of different length, must necessarily adopt an angular direction, so do longitudinal veins, in consequence of a varied situation and the length of the transverse veins. The outline of the wing, the length of the longitudinal veins, the situation and length of the transverse veins, as well as the area of the two membranes of the wing, stand in such a relation to each other that the wonderful effect of their hardening after the exclusion of the insect will be a surface more or less even, but in every case fit for the performance of flight, the main agents of which are apparently the anterior part of the wing, as being more stout and rigid, and its posterior part, which, being in most cases united with the former by the small transverse vein only, is more movable, and acts as an inclined plane, propelling the insect during the motions of the wings both up and down. It is in such genera only as *Syritta*, *Bombylius*, *Nemestrina*, the habits of which require not so much a rapid locomotion, as a constant hovering over a spot, that a multiplied connection of the anterior and posterior part of the wing by transverse veins restrains the mobility of the posterior part of the wing, and renders its propelling effect less sensible.

A correct understanding of a very intricate neuration is in many cases by far not so difficult as that of a very incomplete one. The latter will be best obtained by observing, that in such wings the three anterior trunks of the veins are not only incompletely developed, but also crowded together on the anterior part of the wing, an uncommonly large space being allotted to the fourth trunk. In this way, the striking narrowness of the anterior and middle parts of the wing and the extraordinary dilatation of the posterior part, find their explanation. Sometimes a closer examination of the surface of the wing will yield a useful result by our observing the different kind of hair peculiar to the veins, and which remains, though the veins themselves are wanting. All Diptera with very incomplete neuration are bad fliers, since the greater flexibility of the posterior part of their wings can but imperfectly compensate the propelling effect of this part when sustained by a stronger neuration.

The legs of diptera, like those of the other orders, consist of four principal parts, called the hips (*coxæ*), thighs (*femora*), shanks (*tibiæ*), and feet (*tarsi*). The hips consist of two joints; the second, smaller one, is called *trochanter*. The feet are generally five-jointed; the first joint is called *metatarsus*. At the tip of the last joint there are two claws (*ungues*), and under each of them there is generally a membranaceous appendage called *pulvillus*. Besides these appendages, many families have between them a third single appendage of similar structure, which is called *empodium;* in other families this organ is bristle-like, or altogether wanting.

I have little to say about the expressions for the different characters of the surface and the clothing of the parts of the body of Diptera; I will observe only that the gradations hoary (*pruinosus*), dusted (*pollinosus*), mealy (*farinosus*), or pubescent (*pubescens*), hairy (*pilosus*), bristly (*setosus*), etc., in their application must be judged more according to a relative than an absolute scale, viz., in a family that has coarse hair the same is called hairy, which in another with fine hair is termed bristly, and so in similar cases. If we were not willing to do so, expressions would fail to point out the existing differences.

1



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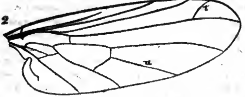

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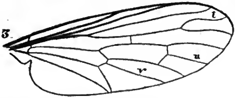

1. *Wing of Ortalis.*
   - *a.* Transverse shoulder-vein (vena transversa humeralis).
   - *b.* Auxiliary vein (vena auxiliaris).
   - *c, d, e, f, g,* and *h.* First, second, third, fourth, fifth, and sixth longitudinal veins (venæ longitudinales prima, secunda, tertia, quarta, quinta, et sexta).
   - *i.* Small or middle transverse vein (vena transversa minor s. media).
   - *k.* Hinder transverse vein (vena transversa posterior).
   - *l, m, n, o.* Costal vein (vena costalis).
   - *p.* Anterior basal transverse vein (vena transversa basalis anterior).
   - *q.* Posterior basal transverse vein (vena transversa basalis posterior).
   - *r.* Rudiment of the fourth trunk.
   - *s.* Axillary incision (incisura axillaris).
   - *A, B,* and *C.* First, second, and third costal-cells (cellulae costales prima, secunda, et tertia).
   - *D.* Marginal cell (cellula marginalis).
   - *E.* Submarginal cell (cellula submarginalis).
   - *F, G,* and *H.* First, second, and third posterior cells (cellulæ posteriores prima, secunda, et tertia).
   - *I.* Discal cell (cellula discoidalis).
   - *K.* First or large basal cell (cellula basalis prima s. major).
   - *L.* Second basal cell, or anterior of the small basal cells.
   - *M.* Third basal cell, or posterior of the small basal cells.
   - *N.* Anal or axillary corner of the wing (angulus analis s. axillaris).
   - *O.* Alar appendage (alula).
2. *Wing of Empis.*
   - *t.* Anterior branch of the third longitudinal vein (venae longitudinalis tertiae ramus anterior).
   - *u.* Anterior intercalary vein (vena intercalaris anterior).
3. *Wing of Dasypogon.*
   - *t.* Anterior branch of the third longitudinal vein.
   - *u.* Anterior intercalary vein.
   - *v.* Posterior intercalary vein.

DIPTERA

OF

NORTH AMERICA.

I.

SKETCH OF THE SYSTEMATIC ARRANGEMENT OF DIPTERA: WITH AN ENUMERATION OF THE GENERA HITHERTO RECORDED AS FOUND IN NORTH AMERICA.

OUR knowledge of the Dipterological Fauna of North America has lately made rapid progress by the great attention paid to it by Baron Osten Sacken during his residence in Washington. As a preliminary to further investigations, he prepared, in 1858, for publication by the Smithsonian Institution, a Catalogue of the then described North American Diptera, which had the great and essential merit of nearly entire completeness. It cannot but be considered as a wise precaution that he did not enter upon a critical examination of the published species, as he well understood that such an examination could only be the work of the combined efforts of many persons, and the fruit of a long toil of years, and that consequently undertaking it would have indefinitely retarded the publication of such a catalogue, so desirable for the advancement of North American Dipterology. The impulse caused by Baron Osten Sacken's Catalogue is already evident, and it has proved a welcome and valuable assistance to every one attempting a more thorough study of North American Diptera, by an intelligible arrangement of the already published species, not only sparing him much laborious research, but also giving him the certainty of not overlooking a species already described. But although this Catalogue presents a survey of all papers hitherto published, and of the contributions of each author, it does not, and according to its plan could not, afford a survey of the North American *Fauna Dipterologica*, corresponding to the present state of systematic Dipterology; on the contrary, sketching such a survey is one of the tasks to which it looks forward to as one of the first fruits of its publication. It would be quite impossible to draw such a systematic survey of the hitherto known North American Diptera from the Catalogue itself, since it comprises the publications of the authors of different times and countries, of writers who had the most different systematic ideas and points of view, and since, in consequence of its plan, it could not but include such papers as are devoid of any solid knowledge of systematic Dipterology—to which, above all, the descriptions of Rob. Desvoidy, and, in a still higher degree, those of Mr. Walker belong. Consequently a survey of those families and genera which North America really possesses, is to be acquired in no other way than from the inspection and careful investigation of the species themselves. The rich collections of Baron Osten-Sacken have enabled me to examine a number of North American species sufficient to allow me to venture an essay of the kind indicated. In this survey I have adopted for the North American Fauna the same area as that of Baron Osten Sacken's Catalogue, the materials upon which I establish my work corresponding to this area. Still it cannot be denied, as far as I am able to judge, that this area, in its southern extent, reaches beyond the limits of the North American zoological province. In order to give a true, though of course not complete sketch of the North American Dipterological Fauna, I can, besides such species as I know by my own inspection, have regard only to those the systematic location of which is in no way doubtful.

For many years past all *Diptera* have been divided into two large sections, *Nemocera* and *Brachycera*. In the Diptera of the first section the antenna, having the fundamental form of a thread, consists of many joints, two of them being called the joints of the *scapus*, the following those of the *flagellum*. The latter are all of the same structure, although this structure varies in different species. The first joint of the flagellum, *i. e.*, the third of the whole antenna, is never so *distinguished* in size or structure that one might consider the succeeding joints as its accessorial appendages, nor is the connection of the joints (with the exception of the *Bibionidæ*, *Mycetophilidæ*, and a few others) such as might lead us to consider them as one, divided into several annuliform segments. In the second section, the *Brachycera*, the two joints of the scapus are likewise separated; the third joint, or first of the flagellum, usually differs by its remarkably developed size and its anatomical structure, causing it to be considered as a sensorial organ about the nature of which entomologists are not yet agreed. The succeeding joints of the flagellum are much reduced in size, generally very few in number, and often of unequal number in nearly related genera, or even in species of the same genus. They even disappear entirely in some genera (*e. g.*, in *Scenopinus*). If they are extant, they have usually the form of a style or bristle, the position of which, according to its nature, is in fact apical, although, from the development of the under side of the third joint, the bristle often seems inserted on its back, or even, in some instances, in the immediate vicinity of the base itself. In the genera, in which the first joint of the flagellum is not of a remarkable size, the following joints are generally more numerous, and either all or the greater part of them share the peculiar organization showing their function to be that of a sensorial organ. They are applied at the same time so closely to the first joint of the flagellum, that we are compelled to consider all of them together as one, divided into several segments, or the terminal one as a style or bristle of a single joint, formed by the other joints of the flagellum. Consequently the essential difference between the sections *Nemocera* et *Brachycera* is this, that in the latter the number of joints of the flagellum is not only smaller, but also that the lower joint, sometimes a few joints, always the lower ones, rarely all, have a more distinct development, and at the same time a peculiar anatomical structure undoubtedly proving their function to be that of a sensorial organ.

It cannot be denied that those families of *Brachycera* in which several of the joints of the flagellum are so soldered together as to form one compound and annulated mass, stand nearest to the section of *Nemocera*, and that amongst these families the *Xylophagidæ* must be placed immediately on the limit of both sections. It is more difficult to point out a family of *Nemocera*, which comes nearer to the section of Brachycera than all the others; in general the families of *Rhyphidæ* and *Bibionidæ* may be considered as those to which this station must be assigned. It is a fact that some discoveries made in modern times have obliterated to a certain degree the sharpness of the limit which was considered to exist between the sections of *Nemocera* and *Brachycera*. The fact known long ago, that in some genera of *Stratiomydæ* and *Tabanidæ* the joints of the flagellum not being closely compressed, do not form a compact joint, has been rather neglected in this respect, perhaps because the *Stratiomydæ* and *Tabanidæ*, by their whole organization, are rather remote from the *Nemocera*, and have so strikingly peculiar characters as individual families, that their comparison with the *Nemocera* has scarcely been thought of. The case was different when a similar structure was observed in the family of *Xylophagidæ*. After I had myself first pointed out the genera *Electra* and *Chrysothemis*, discovered by me in Prussian amber, Mr. Haliday found the still more surprising North American genus *Rachicerus*. I shall have hereafter to mention a second North American genus of *Xylophagidæ*, which has the flagellum of the antennæ not annulated, but really many-jointed. All these facts, however, are not sufficient to compel us at present to give up the separation of the *Nemocera* and *Brachycera*.

Many authorities have likewise objected to uniting under the head of *Brachycera* all those families which cannot be referred to the *Nemocera*, especially and with the fullest reason, to the union of the *Hippoboscidæ* with the other *Brachycera*, since both the history of their development and their internal and external anatomy essentially differ from them. They can only be considered as a third section, co-ordinate to the *Nemocera* and *Brachycera*, and having the same systematic value, and may be named *Coriacea*, or they may be opposed to the other two together as equivalent, and consequently be comprised under the name of *Eproboscidea*, that of *Proboscidea* being left to the two other sections. I intend to follow the first of these two arrangements.

Of the families which I shall hereafter enumerate as belonging to the *Brachycera*, the *Phoridæ* alone have occasioned some doubts about their title to this place, founded, if I judge correctly, on the abnormal structure of their antennæ; these are considered as one-jointed, with the terminal bristle consisting of several joints. Judging by the anatomical structure, I for my part am unable to see in the joint, which is pre-eminently developed and forms the main body of the antennæ, more than the first joint of the flagellum, its peculiarity arising from the soldering together and stunting of the two joints of the scapus, the covering of which is moreover less horny than in the other families of *Brachycera*. This difference, surprising as it is, does not seem to me to have systematic importance enough to require a separation of the *Phoridæ* from the remaining *Brachycera*, and the less so as similar deviations, though not nearly of so striking a nature, also occur in other families. I mention, as an instance, the remarkably stunted second joint of the antennæ in the genus *Haltericerus* Rond. among the *Dolichopidæ*.

I. NEMOCERA.

FAM. I. CULICIDAE.

Charact.—Ocelli none. Thorax without transverse suture. Costal vein continued round the margin of the wing, fringed with scales; veins in their last subdivisions more than six in number.

This family, rich in species, comprises only a small number of genera. As such, the old well-known genera CULEX, AËDES, ANOPHELES, and CORETHRA are to be named first, being those among which Meigen has distributed the European species. To them may be added the genera MEGARHINA, PSOROPHORA, and SABETHES, separated from *Culex* by Rob. Desvoidy, the two last being scarcely tenable, whereas *Megarhina* is acknowledged as holding good. The genus MOCHLONYX, established by me, is very near to *Corethra*, differing, however, by the abbreviation of the first tarsal joint.

Species of the genera CULEX and ANOPHELES occur over all parts of N. A., whereas MEGARHINA and PSOROPHORA are only represented by single species belonging, as it seems, more to the South, as is also CORETHRA by *C. punctipennis* Say.

FAM. II. CHIRONOMIDAE.

Charact.—Ocelli none. Thorax without transverse suture. Wings without vein along the posterior margin; costal vein ending near the tip of the wing.

This family is not much richer in genera than that of the *Culicidæ*, but far more so in species. It contains the old and well-established genera CHIRONOMUS, TANYPUS, and CERATOPOGON, to which have been added the genera HYDROBÆNUS Fries (= *Corynocerus* Ruthe), DIAMESA Meig., CORYNONEURA Winn., and CLUNIO Hal., which is so remarkable by the habitation of its larva. The species of *Ceratopogon* exhibit a good deal of varied organization. A division into a number of smaller genera, which is indispensable, has been attempted, but not executed in a satisfactory manner, and the genera LABIDOMYIA Steph., CULICOIDES Latr., PALPOMYIA Meig., SPHÆROMIAS Steph., and PRIONOMYIA Steph. can be only considered at present as sub-genera of *Ceratopogon*. The genus THALASSOMYIA Schin. has been separated from *Chironomus*. Also the genus MACROPEZA Meig. must be united with the *Chironomidæ*, and Macquart is right in having done so in his "Diptères exotiques." The genus ORPHNEPHILA Hal. (= *Thaumalea* Ruthe = *Chenesia* Macq.) differs from all the other *Chironomidæ* by the veins of the wings running without attenuation to, and the costal vein being continued round, the posterior border. If we do not establish a separate family for it, its proper place will be here, but as an anomalous genus.

The genera CHIRONOMUS, TANYPUS, and CERATOPOGON are largely represented in N. A.; the most interesting are the species of *Ceratopogon*. *Heteromyia* Say belongs here. Of the remaining genera, I have seen only one N. A. species, which belongs to the genus ORPHNEPHILA, and does not seem to differ from *O. testacea* Ruthe.

FAM. III. CECIDOMYIDAE.

Charact.—Ocelli often none. Thorax without transverse suture. Coxæ not elongated, femora not thickened, tibiæ without spurs. Wings having only few longitudinal veins.

It is rather difficult to define sharply this most interesting family, and consequently to characterize it exactly. It contains a very large number of extremely delicate and elegant minute species, remarkable by long and easily rubbed off hairs on the wings and the other parts of the body. The limits between the families *Cecidomyidæ* (Gall-gnats) and *Mycetophilidæ* (Fungus-gnats) are not very easily fixed, since *Zygoneura* Meig. shows a combination of the characters of both; the coxæ being far less elongated and the spurs of the tibiæ far shorter than in any other genus of *Mycetophilidæ:* moreover, the antennæ are moniliform with verticillate hairs, as is frequently the case in the *Cecidomyidæ* and never so among *Mycetophilidæ.* But the total habitus of the *Zygoneuræ* being more like that of the former than of the latter, and the tibial spurs being so very short, that in some species they can only be discovered by the closest scrutiny, I think I may be justified if I add them to the *Cecidomyidæ*, though in many respects they agree with the genus *Sciara*, which has its natural place among the *Mycetophilidæ*.

The whole family is divided into two sections. The first of these, the CECIDOMYINA, have on the wings four longitudinal veins, the two last of which often coalesce in the beginning of their course, or are more or less incomplete. They have no ocelli, and the first joint of their tarsi is much shortened. The genera belonging here are: HORMOMYIA *Loew*, DIPLOSIS *Loew*, CECIDOMYIA *Latr.*, ASPHONDYLIA *Loew*, DIRHIZA *Loew*, COLPODIA *Winn.*, EPIDOSIS *Loew*, ASYNAPTA *Loew*, LASIOPTERA *Meig.*, and CLINORHYNCHA *Loew*. In the genera of the second section, the ANARETINA, between the second and third of those veins of the wings which the first section possesses, another longitudinal vein is inserted, being simple only in Campylomyza, while it is furcate in all the other genera; the first tarsal joint is not shortened, and in all genera, with the single exception of *Cecidogona*, there are distinct ocelli. To this section belong: CAMPYLOMYZA *Meig.*, CECIDOGONA *Loew*, ANARETE *Hal.*, CATOCHA *Hal.* (= *Macrostyla* Winn.), LESTREMIA *Macq.* (= *Diamesa* Meig.), and ZYGONEURA *Meig.*

I have omitted here the genera HETEROPEZA *Winn.* and SPANIOCERA *Winn.*, not having had an opportunity of examining specimens. *Heteropeza* seems to harmonize in many points with the genera of the first section, but differs very strikingly by the totally different structure of its tarsi. Rondani has established in this family a good number of genera, which are, however, quite unavailable, since the observations on which they are founded are too inexact.

Very little information has thus far been published respecting the *Cecidomyidæ* of N. A. Most of the species sufficiently described belong to the genus *Cecidomyia* in its restricted sense, as is now in use; viz: *Cec. destructor* Say, *salicis* Fitch, and *tritici* Kirby; *Cec. grossulariæ* Fitch ought, as it seems, to be referred to the genus ASPHONDYLIA; some fine species of the genera DIPLOSIS and LASIOPTERA occur there. Out of the second section I have seen species of the genera CAMPYLOMYZA, ZYGONEURA and LESTREMIA. Of a new genus belonging to the same section, I have seen only one incomplete individual.

FAM. IV. BLEPHAROCERIDAE.

Charact.—Ocelli three. Wings very ample, naked (*i. e.* with hairs only perceptible under a very highly magnifying lens), with cracks caused apparently by folding; no discoidal cell. Posterior tibiæ with stout spurs, anterior tibiæ unarmed.

The genus BLEPHAROCERA *Macq.* cannot, except by the utmost constraint, be included in any of the existing families. Its nearest relation is the Ceylanese genus TANYRHINA *Loew.* I unite these two genera in one small family, the name of which I derive from the older of the two. The *Blepharoceridæ* differ from the *Cecidomyidæ* by the stout terminal spur of their posterior tibiæ, from the *Mycetophilidæ* by their coxæ not being elongated, from the *Bibionidæ* by the want of an empodium and pulvilli, and by the very little development of their prothorax. In the form and tissue of their wings they are most nearly allied to the *Simulidæ*, but by the existence of ocelli, and by the long slender legs, they seem to me to differ from them too much to be reunited with them. The neuration of their wings is rather similar to that of the *Cecidomyidæ;* but *Blepharocera* has some more longitudinal veins, and thus its neuration resembles that of *Macropeza.* Besides the longitudinal veins, the wings show some fine cracks, perfectly similar in both, and looking as though produced by the expansion of the wings, which had previously been folded; this mark is peculiar to them, pointing to some peculiarities in their transformation unfortunately still unknown; some certainty about the place due to them in the system may, therefore, be expected from the knowledge of their earlier stages.

I know only one N. A. species of BLEPHAROCERA very much resembling that species which is spread over a great part of Europe. *Blepharocera americana* Walk. neither belongs to this genus, nor even to this family.

FAM. V. PSYCHODIDAE.

Charact.—No ocelli. Body with long, coarse hairs. Thorax without a transverse suture. Tibiæ without spurs. Wings everywhere with long coarse hairs, many longitudinal veins, and only a few transverse veins; no discoidal cells.

The genera of *Psychodidæ*, on account of their neuration, form two sections; in the first, the PSYCHODINA, there are, between the furcate longitudinal veins common to all genera, two simple longitudinal veins. The genera of this section are: PSYCHODA *Latr.*, PERICOMA *Hal.*, ULOMYIA *Hal.* (= *Saccopteryx* Hal. ol.), POSTHON *Loew*, and NYGMATODES *Loew* (= *Nemapalpus* Macq.). In the second section, the PHLEBOTOMINA, we see only one longitudinal vein between the two furcate veins. The genera belonging here are: PHLEBOTOMUS *Rond.* (= *Hæmasson* Loew), TRICHOMYIA *Hal.* (= *Phalænomyia* Loew), SYCORAX *Hal.*, DIPLONEMA *Loew*, and PHILÆMATUS *Loew*.

The small number of N. A. *Psychodidæ* I have seen, belong without exception to the genera PSYCHODA and PERICOMA. In Europe there have been discovered besides the genera *Ulomyia*, *Phlebotomus*, *Trichomyia*, and *Sycorax*. From the smallness and fragility of *Psychodidæ*, it may easily be conceived why so few N. A. species have still been detected.

FAM. VI. TIPULIDAE.

Charact.—No ocelli.* Thorax with a V-shaped transverse suture. Legs very elongated; the basal cells of the wings reaching beyond the middle; discal cell existing in most of the genera.

The want of ocelli, the considerable length of the legs as well as of the basal half of the wings (the latter cause producing a prolongation of the basal cells beyond the middle of the wing), are the most essential characters of this family. Moreover, the V-shaped transverse suture of the thorax is of the greatest value, since only the anomalous genera DIXA *Meig.* and CHIONEA *Dalman* are destitute of it. It does not seem natural to attribute to the former genus, on account of this circumstance, any other place but among the *Tipulidæ*. The abnormal structure of the thorax in the wingless genus *Chionea* is less surprising, its form depending chiefly on the situation and size of the alary muscles, and, however it may differ in some respects from all the other genera of *Tipulidæ*, it would be still more inconveniently located in any other family. Whether the genus POLYMERA *Wied.*, which is distinguished by its moniliform antennæ and the basal cells not reaching to the middle of the wings, may be placed among the *Tipulidæ*, appears doubtful. I should have thought it belonged to the tribe *Psychodidæ*, had not Macquart figured the thorax of *Polymera fusca* with a distinct V-shaped transverse suture.

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* Except in *Trichocera*, where they exist. O. S.

The variety of forms prevailing in the family of *Tipulidæ* has caused the foundation of a rather large number of genera. In order to facilitate the description of the new species and the identification of the described ones, a considerable increase of the number of genera is indispensable.

On the whole, the *Tipulidæ* may be divided into two sections, the TIPULINA having long, and the LIMNOBINA having short palpi. This division, indeed, is no natural one, since some genera with long palpi agree in all the rest of their organization more with the genera of the second than of the first section.

The genera of *Tipulidæ* hitherto established, as I know them by sight, or, in part, by the definitions of their authors, may be distributed as follows. To the *Tipulina* belong: TIPULA *Linn.*, PRIONOCERA *Loew*, PACHYRHINA *Macq.*, NEPHROTOMA *Meig.*, CTENOPHORA *Meig.*, DOLICHOPEZA *Meig.*, OZODICERA *Macq.*, CTENOGYNA *Macq.*, GYNOPLISTIA *Westw.*, PTILOGYNA *Westw.*, MEGISTOCERA *Wied.*, APEILESIS *Macq.*, PTYCHOPTERA *Meig.*, MACROCHILE *Loew*, PROTOPLASA *O. S.*, PTEROCOSMUS *Walk.*, HESPERINUS *Walk.*, BITTACOMORPHA *Westw.*, and RHAMPHIDIA *Meig.* To the section of *Limnobina* must be referred: LIMNOBIA *Meig.*, GLOCHINA *Meig.*, RHIPIDIA *Meig.*, GERANOMYIA *Hal.* (= *Aporosa* Macq.), DICRANOMYIA *Steph.*, ANTOCHA *O. S.*, ELEPHANTOMYIA *O. S.*, LIMNOBIORHYNCHUS *Westw.* (= *Toxorhina* Loew), DICRANOPTYCHA *O. S.*, TEUCHOLABIS *O. S.*, ERIOPTERA *Meig.*, SYMPLECTA *Meig.*, CRYPTOLABIS *O. S.*, GONOMYIA *Meg.*, GNOPHOMYIA *O. S.*, CLADURA *O. S.*, TRICHOCERA *Meig.*, CYLINDROTOMA *Meig.*, ANISOMERA *Meig.*, ARRHENICA *O. S.*, ERIOCERA *Macq.*, DICRANOTA *Zett.*, ULA *Hal.*, AMALOPIS *Hal.*, TRICYPHONA *Zett.*, EVANIOPTERA *Guér.*, PEDICIA *Latr.*, LIMNOPHILA *Macq.*, EPIPHRAGMA *O. S.*, DICRANOPHRAGMA

O. S., IDIOPTERA *Macq.*, LASIOMASTIX *O. S.*, DACTYLOLABIS *O. S.*, PRIONOLABIS *O. S.*; as *Limnobina* may also be mentioned the fossil genera which have been found in Prussian amber: TRICHONEURA, CALOBAMON, HAPLONEURA, CRITONEURA, TANYMERA, TANYSPHYRA, STYRINOOMYIA, ATARACTA, and ALLARITHMIA. As genera of doubtful location we may add the genus POLYMERA *Wied.*, and the anomalous genera DIXA *Meig.* and CHIONEA *Dalm.*

We know as genera of *Tipulina* occurring in N. A. the following: TIPULA, PACHYRHINA, CTENOPHORA, PTILOGYNA, PTYCHOPTERA, PROTOPLASA, HESPERINUS, BITTACOMORPHA, and RHAMPHIDIA. About the genera and species of *Limnobina* indigenous in N. A., Baron Osten Sacken, in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1859, has published a detailed and valuable paper, which enters into a more complete and thorough exposition of the system of this section than is possible for me to give here. I must, therefore, refer to this paper. The species enumerated in it, most of which are new, belong to the following genera: *Limnobia*, *Rhipidia*, *Geranomyia*, *Dicranomyia*, *Antocha*, *Elephantomyia*, *Limnobiorhynchus*, *Dicranoptycha*, *Teucholabis*, *Erioptera*, *Symplecta*, *Cryptolabis*, *Gonomyia*, *Gnophomyia*, *Cladura*, *Trichocera*, *Anisomera*, *Arrhenica*, *Eriocera*, *Dicranota*, *Ula*, *Amalopis*, *Pedicia*, *Limnophila*, *Epiphragma*, *Dicranophragma*, *Idioptera*, *Lasiomastix*, *Dactylolabis*, and *Prionolabis*; also *Dixa* and *Chionea* are recorded as N. A. genera.

Note.—The special attention which I have, for several years, paid to the family of *Tipulidæ* may serve as an excuse for my expressing here my views on its distribution. Although these views are founded merely on the study of the species of this continent, the new character which I introduce for the definition of the two principal sub-families may also prove useful for the classification of the *Tipulidæ* of other countries.

I divide the American species of *Tipulidæ*, at present known, into three sub-families, as follows:—

I. *The auxiliary vein ends in the first longitudinal vein;* besides the humeral cross vein, there is no other cross vein between the auxiliary vein and the first longitudinal vein or the costa; last joint of palpi very long, filiform, generally longer than the three preceding taken together. TIPULINA.

II. *The auxiliary vein ends in the costa;* there is a cross vein between it and the second longitudinal vein, generally more or less approximated to the tip of the *first* longitudinal vein, sometimes more removed from it towards the base of the wings; palpi in most cases short; last joint either very short, or, if elongated, hardly longer than the three preceding taken together LIMNOBINA.

III. Sixth longitudinal vein (*anal* vein of the former authors) obsolete. PTYCHOPTERINA.

The two first large groups are further distinguished by the structure of the genital organs of the male, which, in most of the *Limnobina*, are represented by a forceps, consisting of two movable, fleshy lobes, with some delicate horny appendages; whereas in the *Tipulina* the forceps is a very compound organ, consisting of manifold horny pieces, which, being inclosed between the dorsal and ventral plates of the two last abdominal segments, produce the club-shaped appearance peculiar to the tip of the abdomen of this sub-family.

Thus founded, not on a single character, but on a combination of characters taken from various organs, the definition of the two great subfamilies hardly leaves any doubtful case among the *Tipulidæ* which I know of. If one character fails to give a satisfactory result, the others will generally remove at once any doubt as to the relationship of the species. Thus, the last joint of the palpi of *Pedicia* is unusually long; but the auxiliary vein, ending in the subcosta, and the presence of a cross vein between it and the second vein, immediately refer it to the *Limnobina*, where this genus naturally belongs on account of its habitus. (I have neglected to examine this last joint in fresh specimens of *Pedicia*, but it appears very probable that its disproportion with the other joints is far from being so striking as is the case in the *Tipulina*.)

In *Rhamphidia*, the last joint of the palpi is represented by former writers to be elongated. I had no occasion to ascertain, on living specimens, how far this is correct. But the presence of the cross vein places this genus among the *Limnobina*, where it naturally belongs by its habitus. And even if this character should not be considered as sufficient, on account of the extreme shortness of the cross vein, placed at the very tip of the auxiliary vein, the structure of the male genitals removes all doubt.

In some *Pachyrhinæ* there is, near the tip of the auxiliary vein, a blackish dot, which might perhaps be mistaken for a cross vein. But should it even be considered as a rudiment of one, the length of the last joint of the palpi, the structure of the male genitals, etc., assign its place among the *Tipulina*, where its habitus most evidently refers it.

In the singular genus *Antocha* O. S. the costa and the auxiliary and the first longitudinal veins coalesce insensibly together, so that there is no room left for a cross vein. In this case, the shortness of the palpi and the structure of the male genitals decide of its location among the *Limnobina*.

I refer to my sub-family of *Ptychopterina* the genera *Ptychoptera*, *Bittacomorpha*, and *Protoplasa* (with its congener *Macrochile* Loew). As to the distribution of the other genera among the two remaining sub-families, I agree with Mr. Loew, with the following exceptions:—

Rhamphidia, as shown above, is more related to the *Limnobina* than to the *Tipulina;* by all means it ought not to be separated from *Elephantomyia*, as Mr. Loew does it. In my paper on the *Limnobina* of this country, I have explained the close relationship of both. *Elephantomyia* is nothing but a *Rhamphidia* with an enormously prolonged rostrum, the development of which has also modified the character of the palpi inserted at its tip. (*Geranomyia*, with its long rostrum and stunted palpi, stands precisely in the same relation to *Dicranomyia*.).

Gynoplistia Westw. (an Australian genus) and *Polymera* Wied., both of which I know only from plates and descriptions, belong, I presume, to the *Limnobina*.

Hesperinus, Walk. belongs to the *Bibionidæ* (see my note in that family). About *Pterocosmus* Walk. I have no opinion whatever, not having seen it, and not being able to establish any opinion on the description.

To the list of genera already found in North America, I have to add *Dolichopeza*, *Nephrotoma*, and probably *Cylindrotoma*, as I possess a species apparently closely allied to the latter. Finally, it is the place here to notice that Mr. Westwood (Lond. and Edinb. Philos. Magaz., 1835) has described a *Gynoplistia annulata* from North America. As it is hardly probable that an Australian genus should also be represented on this continent, it is to be presumed either that the genus is different, or that the statement is based upon an error of locality. *Gynoplistia* has pectinated antennæ in both male and female.

Osten Sacken.

Fam. VII. MYCETOPHILIDAE.

Charact.—Ocelli three or two, in the latter case often hardly perceptible. Thorax without a transverse suture; wings without discal cell. Coxæ much elongated; all the tibiæ with spurs.

On the whole, the *Mycetophilidæ* are so easily known that it would be superfluous to give any more details about them. The genus differing the most from the rest is *Sciara*, which shows some affinity with the *Cecidomyidæ*.

The genera hitherto introduced in this family are the following: Cordyla *Meig.* (= *Brachypalpus* Macq.), Mycetophila *Meig.*, Azana *Walk.*, Leja *Meig.*, Boletina *Staeg.* (= *Leptomorphus* Walk.), Sciophila *Meig.*, Sciobia *Loew*, Tetragoneura *Winn.*, Gnoriste *Meig.*, Asindulum *Latr.* (= *Macrorhyncha* Winn.), Ceroplatus *Fabr.*, Leptomorphus *Curt.*, Diadocidia *Ruth.* (= *Macroneura* Winn.), Aclada *Loew*, Mycetobia *Meig.*, Plesiastina *Winn.*, Ditomyia *Winn.* (*Symmerus* Walk.), Platyura *Meig.*, Platyroptilon *Westw.*, Macrocera *Meig.*, Bolitophila

Meig. (= *Messala* Curt.), HETEROTRICHA *Loew*, DIANEPSIA *Loew*, SCIARA *Fabr.*, and the genus DIOMONUS *Walk.*, which is unknown to me. I have not mentioned the genus SYNAPHA *Meig.*, because it seems to have been founded on an individual of a species of *Leja*, which possessed an irregularly formed neuration; at least as far as I know, no second specimen of *Synapha* has been captured since Meigen's time, while a similar anomaly of neuration of the wings has been observed several times in other Diptera.

Our knowledge of N. A. *Mycetophilidæ* is exceedingly incomplete. I have seen species of the genera MYCETOPHILA, BOLETINA, SCIOPHILA, TETRAGONEURA, PLESIASTINA, DITOMYIA, PLATYURA, MACROCERA, BOLITOPHILA, and SCIARA. Besides these, the existence of CEROPLATUS seems to be certain, and the genus DIOMONUS, which I have never seen, is founded on a N. A. species.

FAM. VIII. SIMULIDAE.

Charact.—Ocelli none. Thorax without transverse suture. Wings with very short hair only visible under a very high magnifying power; legs short, tibiæ without spurs; posterior tibiæ and first joint of the hind tarsi dilated.

The present family comprises only the genus SIMULIUM *Latr.*, rich in species and which cannot be placed in any other family. It does not seem to be less rich in species in N. A. than in Europe.

FAM. IX. BIBIONIDAE.

Charact.—Ocelli three. Thorax without transverse suture; prothorax much developed. Wings without discal cell; coxæ not prolonged; empodium proportionally long, whereas the pulvilli are wanting in some of the genera.

The family of *Bibionidæ* is divided into two sections sharply separated from each other, and which it would be proper to consider as distinct families. In the SCATOPSINA, which form the first section, the palpi are very short, the pulvilli wanting, the tibiæ without spurs; the genera belonging to them are: SCATOPSE *Geoffr.*, ASPISTES *Meig.*, ARTHRIA *Kirby*. To the second section, the BIBIONINA, belong: DILOPHUS *Meig.*, BIBIO *Geoffr.*, PENTHE-

TRIA *Meig.*, CRAPITULA *Gimm.*, PLECIA *Wied.*, EUPEITENUS *Macq.*, PACHYNEURA *Zett.*, and SPODIUS *Loew.*

Species of the genera SCATOPSE, ARTHRIA, DILOPHUS, BIBIO, PLECIA, and EUPEITENUS are known to occur in N. A.

Note.—At the time when this was written by Mr. Loew, neither he nor I possessed specimens of the genus *Hesperinus*, which its author, Mr. Walker, referred to the *Tipulidæ*. Having obtained specimens since, collected by Mr. R. Kennicott near the Great Slave Lake, I found that *Hesperinus* belongs to the *Bibionidæ*, and is apparently synonymous with *Spodius* Loew. Accordingly, *Hesperinus* Walk. is to be added to the genera of this family occurring in N. A., and stricken out from among the *Tipulidæ*. O. S.

FAM. X. RHYPHIDAE.

Charact.—Ocelli three. Thorax without transverse suture; wings with a perfect discal cell; empodium similar to a pulvillus; pulvilli wanting.

Of this family also a single genus, RHYPHUS *Meig.*, is known, which has representatives in Europa, Asia, and N. A.

Observation.—There is a genus *Epidapus* Hal., remarkable for having no wings and no poisers, which I have omitted in the preceding enumeration of families, because I do not know it. It is quite impossible to place it among the *Mycetophilidæ*, as Walker does, if we characterize the families as we have done. It rather seems to find its place among the *Cecidomyidæ;* but there is nothing decisive to be said without the examination of fresh specimens.

II. BRACHYCERA.

FAM. XI. XYLOPHAGIDAE.

Charact.—The three basal cells very prolonged, the third longitudinal vein furcate; both intercalary veins always present; the marginal vein encompassing the whole wing; the third joint of the antennæ annulated or divided into separate joints, always without style or terminal bristle. Tibiæ with spurs; the empodium very developed and pulvilliform.

The genera belonging here are: XYLOPHAGUS *Meig.*, PACHYSTOMUS *Latr.*, SUBULA *Meig.*, ELECTRA *Loew*, CHRYSOTHEMIS

Loew, RACHICERUS *Hal.*, COENOMYIA *Latr.*, and ARTHROPEAS *Loew*. The new genera CYCLOTELUS, PHYCUS, and DIMASSUS, established by Walker as belonging to the *Xylophagidæ*, belong in fact to the *Therevidæ;* likewise NONACRIS must be removed here, but Walker's observations on its characters are far too superficial to admit of any certainty in fixing its place; also DIALYSIS on account of the hairy, bristle-like antennal tip ascribed to it by Walker might seem to be erroneously located among the *Xylophagidæ*, the characters of which he appears not to have understood.

Cœnomyia Latr. has often been separated from the *Xylophagidæ* and considered as forming a distinct family: *Cœnomyidæ*, or formerly *Sicarii*. This seems to have been caused by the body of *Cœnomyia* being stout, whereas that of *Xylophagus* and *Subula* is of a slender form. Moreover, the different form of the palpi, which in *Cœnomyia* are rather cylindrical and ending in *Xylophagus* and *Subula* in a button-shaped thickening, have been made use of to justify the separation. But within a recent time forms of *Cœnomyidæ* have been discovered in which the structure of the body and palpi is such as to form a link between them and the *Xylophagidæ;* from this, as well as from the agreement of their other essential characters, results the necessity of reuniting them. In case the separation should be maintained, *Arthropeas* ought to be placed among the *Cœnomyidæ*.

The family of *Xylophagidæ* may be divided into three sections: CŒNOMYINA, RACHICERINA, and XYLOPHAGINA. The *Cœnomyina* are characterized by their robust structure, the third joint of the antennæ being annulated and pointed towards its end, the palpi being cylindrical. The genera comprised here are CŒNOMYIA and ARTHROPEAS. In the *Rachicerina* the third joint of the antennæ is divided into separate and frequently very numerous articulations, and the palpi are rather club-like; the body is less heavy than in the *Cœnomyina*, but less slender than in the *Xylophagina*. The genera ELECTRA, CHRYSOTHEMIS, and RACHICERUS belong here. The *Xylophagina* have the slenderest bodies; the third joint of the antennæ is annulated and never strikingly pointed; the palpi have at their end a button-shaped thickening. The genera SUBULA, XYLOPHAGUS, and PACHYSTOMUS may be referred here.

I am acquainted with N. A. species belonging to the genera CŒNOMYIA, ARTHROPEAS, RACHICERUS, SUBULA, and XYLOPHAGUS.

Two of the species of RACHICERUS cannot be well placed in this genus without a modification of its characters.

Observation.—I have to mention here the genus BOLBOMYIA, which I established on two fossil species found in Prussian amber. When I published in 1850 my observations on the Dipterological Fauna of amber, I thought it would be best placed among the *Xylophagidæ*. But I perceive from a N. A. specimen belonging to *Bolbomyia* that its claim to that place is more than doubtful, and at the same time that it is quite as difficult to assign it a fit place elsewhere.

FAM. XII. STRATIOMYIDAE.

Charact.—Three basal cells much prolonged; veins of the two main trunks very crowded anteriorly; both intercalary veins usually existing; costal vein reaching only to the middle of the wing. Third joint of the antennæ annulated, sometimes divided into several portions. Tibiæ without spurs; empodium much developed, pulvilliform.

This family, rich in various forms, may be divided into five sharply circumscribed sections. The first is that of the BERIDINA, easily distinguished by the abdomen not showing five segments, as in the other sections, but seven, a difference caused only by the smallness of the two last segments and their concealed situation in the other sections. The *Beridina* have often been placed in the family of *Xylophagidæ*, but figure more naturally among the *Stratiomyidæ*. The genera belonging to them are: METOPONIA *Macq.* (= *Inopus* Walk.), BERIS *Latr.*, ACTINA *Meig.*, EXODONTHA *Rond.*, ACANTHOMYIA *Sch.*, DIPHYSA *Macq.*, CAMPEPROSOPA *Macq.*, perhaps also EXOCHOSTOMA *Macq.*; also the genus CHIROMYZA *Wied.*, which does not differ from *Xenomorpha* Macq., may be referred to them. The second section is that of SARGINA, rather agreeing in the form of the body with the *Beridina*, and even with the *Hermetina*, but differing from the former by the abdomen consisting apparently of five segments, and from the latter by the eyes of the males being much more approximated than those of the females. As genera of this section may be mentioned CACOSIS *Walk.*, ACROCHÆTA *Wied.*, EUDMETA *Wied.*, ANALCOCERUS *Loew*, SALDUBA *Walk.*, TOXOCERA *Macq.*, HOPLISTES *Macq.*, RAPHIOCERA *Macq.*, BASENTIDEMA *Macq.*, DICRANOPHORA *Macq.*, CHRYSOCHLORA *Macq.*, PTECTICUS *Loew*, MEROSARGUS *Loew*, PEDICELLA *Big.*, Chrysonotus *Loew*, Sargus *Fabr.*, Cloriscoma *Rond.*, Chrysomyia *Macq.*, and Microchrysa *Loew*. The third section, Hermetina, is well characterized by the elongated abdomen, the eyes, which are equidistant and very remote in both sexes, and the peculiar structure of the antennæ, the third joint of which is transformed into a ciliated lamel. The genera Hermetia *Latr.*, Thorasena *Macq.* belong to them. The fourth is formed by the Odontomyina, which are distinguished from the foregoing by their broad body and from the following section by the less convex abdomen and especially by the neuration, the longitudinal veins of the *Odontomyina* being more crowded anteriorly, the discal cell being smaller, hexagonal or pentagonal, never large or subquadrate; moreover, both intercalary veins are usually present, while the posterior one is almost always wanting in the *Pachygastrina*. The following genera may be referred to the *Odontomyina:* Cyphomyia *Wied.*, Chordonota *Gerst.*, Euparyphus *Gerst.*, Pycnomalla *Gerst.*, Alliocera *Saund.*, Stratiomys *Geoff.*, Odontomyia *Meig.*, Inermyia *Big.*, Nemotelus *Geoffr.*, Oxycera *Meig.*, Heteroxycera *Big.*, Ephippium *Latr.*, Clitellaria *Meig.*, Cyclogaster *Macq.* (= *Lasiopa* Brull.), Artemida *Walk.*, Aissa *Walk.*, Metabasis *Walk.*, Promeranisa *Walk.* The fifth section is that of the *Pachygastrina;* it is distinguished by the longitudinal veins being less crowded towards the costal border, by the magnitude and quadrangular form of the discal cell, the almost general want of the posterior intercalary vein, the short, generally much inflated, abdomen, and its segments soldered together in some genera. The genera belonging here are: Pachygaster *Meig.*, Lophoteles *Loew*, Sternobrithes *Loew*, Platyna *Wied.*, Biastes *Walk.*, Ptilocera *Wied.*, Chauna *Loew*, Blastocera *Gerst.*, Spyridopa *Gerst.*, Panacris *Gerst.*, Nerua *Walk.*, Culcua *Walk.*, Evaza *Walk.*, Anacanthella *Macq.;* perhaps also Phyllophora *Macq.*, and Anisophysa *Macq.*

To which section of the *Stratiomyidæ* the genera *Solva*, *Ampsalis*, *Tracana*, *Rosapha*, *Tinda*, *Saruga*, *Gabaza*, *Adraga*, and *Obrapa*, lately formed by Walker, are to be referred, the extreme vagueness of the characters ascribed to them does not allow me to determine.

The N. A. species which are now known to me belong to the following genera: I. *Beridina:* Metoponia, Actina; II. *Sargi-*

na: Sargus, Microchrysa: III. *Hermetina:* Hermetia: IV. *Odontomyina:* Cyphomyia, Euparyphus, Stratiomys, Odontomyia, Nemotelus, Oxycera, Clitellaria; V. *Pachygastrina:* Pachygaster, Chauna.

Fam. XIII. ACANTHOMERIDAE.

Charact.—Basal cells much prolonged; longitudinal veins not crowded together anteriorly; two intercalary veins always present; marginal vein running round the whole border of the wing. Oral parts with four bristles, even in the male. Third joint of the antennæ annulate. Tibiæ without spurs; empodium developed to a pulviliar form.

This small family contains only the two genera Acanthomera *Wied.* and Raphiorhynchus *Wied.* It differs from the *Stratiomyidæ* by the longitudinal veins not being crowded together anteriorly, by the marginal vein encompassing the whole border of the wing and by the fourth cell of the posterior margin being closed. It differs from the *Tabanidæ* in the form of the oral parts and by the tegulæ being very little developed; as to the oral parts, I have no absolute opinion of my own, but must rely on the communications of others.

No species of this family has been as yet discovered in N. A.

Fam. XIV. TABANIDAE.

Charact.—Three basal cells much prolonged; third longitudinal vein furcate; two intercalary veins always present; marginal vein running round the whole border of the wing; tegulæ rather large. Proboscis of the male with four, of the female with six bristles. Third joint of the antennæ annulate, rarely divided into distinct joints, always without style or bristle; empodium much developed and pulvilliform.

The *Tabanidæ* are easily distinguished from the foregoing families by the structure of the oral parts and by the size of the tegulæ. On account of the presence or absence of spurs at the end of the posterior tibiæ they may be divided into the sections of Pangonina and Tabanina; the former often, but not always, possess ocelli, whereas, according to the observations hitherto made, they are always wanting in the latter section.

To the *Pangonina* belongs, firstly, the genus Pangonia *Latr.*

with the genera separated from it and partly connected with each other by passages: *Philoliche* Hffgg., *Dicrania* Macq., *Pelecorhynchus* Macq., *Cadicera* Macq., *Nuceria* Walk., *Melpia* Walk., *Scaptia* Walk., *Tacina* Walk., *Phara* Walk., *Clanis* Walk., *Osca* Walk., *Scione* Walk., *Plinthina* Walk., *Scarphia* Walk., and *Lilæa* Walk.; moreover, the genera: SCEPSIS *Walk.*, SILVIUS *Meig.*, MESOMYIA *Macq.*, TABANOCELLA *Big.*, ECTENOPSIS *Macq.*, RHINOMYZA *Wied.*, ERODIORHYNCHUS *Macq.*, GASTROXIDES *Saund.*, PRONOPES *Loew*, CHRYSOPS *Meig.*, and NEMORIUS *Rond.*

The *Tabanina* comprise the genera: TABANUS *Linn.*, with *Therioplectes* Zell., DICHELACERA *Macq.*, LEPISELAGA *Macq.*, SELASOMA *Macq.*, HADRUS *Pert.*, DIABASIS *Macq.*, ACANTHOCERA *Macq.*, DASYBASIS *Macq.*, HEXATOMA *Meig.*, and HÆMATOPOTA *Meig.*

The N. A. species which we are acquainted with belong to the genera: I. *Pangonina:* 1. PANGONIA *Latr.*, 2. SILVIUS *Meig.*, 3. CHRYSOPS *Meig.* II. *Tabanina:* 4. TABANUS *Linn.*, 5. LEPISELAGA *Macq.*, 6. DIABASIS *Macq.*, 7. HÆMATOPOTA *Meig.*

FAM. XV. LEPTIDAE.

Charact.—Three basal cells much prolonged; third longitudinal vein furcate; two intercalary veins always present; marginal vein running round the whole border of the wing. Third joint of the antennæ simple, with a simple or thickened styliform bristle. Tibiæ with spurs; empodium much developed, pulvilliform.

This family is very easily distinguished from the foregoing families by the simple third joint of its antennæ. A division into sections has not been attempted yet, and would be useless for the small number of genera hitherto known. The genera belonging to this family are as follows: DASYOMMA *Macq.*, CHRYSOPILA *Macq.*, TRIPTOTRICHA *Loew*, LEPTIS *Fabr.*, VERMILEO *Macq.* (= *Psammorycter* Blanch.), ATHERIX *Meig.*, NODUTIS *Meg.* (= *Ibisia* Rond.), and SPANIA *Meig.* (= *Ptiolina* Zett. = *Leptipalpus* Rond.).

The location here of the genus *Syneches* is one of the many errors which we meet with in the writings of Mr. Walker.

I know N. A. species belonging to the genera: 1. CHRYSOPILA *Macq.*, 2. LEPTIS *Fabr.*, 3. TRIPTOTRICHA *Loew*, 4. ATHERIX *Meig.* Mr. Walker has also recorded a species of the genus *Spania* Meig.

FAM. XVI. CYRTIDAE.

Charact.—Thorax and abdomen inflated. Eyes occupying the greatest part of the head. Tegulæ vaulted, exceedingly large. Wings naked, with variable neuration, sometimes very intricate, sometimes very incomplete; the basal cells, when present, are of considerable length. Terminal joint of the antennæ simple. Tibiæ without spurs; empodium much developed, pulvilliform.

This family is divided into the two sections of CYRTINA and ONCODINA. In the former section the veins of the wings are strong and well developed, and the neuration is usually rather complicated. It contains the genera: CYRTUS *Latr.*, PTEROPEXUS *Macq.*, EPICERINA *Macq.*, PANOPS *Lam.* (= *Mesophysa* Macq.), LASIA *Wied.*, EULONCHUS Gerst., PSILODERA *Griff.* (= *Mesocera* Macq.), PTERODONTIA *Griff.*, ASTOMELLA *L. Duf.*, PHYLLIS *Erichs.*, OCNÆA *Erichs.* (= *Eriosoma* Macq. = *Exelasis* Walk.), PIALEA *Erichs.*, OBSEBIUS *Cost.* (= *Pithogaster* Lœw), PHYSEGASTER *Macq.*

The section *Oncodina* is distinguished by the anterior veins of the wings alone being completely developed, whereas the posterior ones are not only very incomplete, but also disappear gradually, and frequently are not completely connected. The genera which belong here are: ONCODES *Latr.* (= *Henops* Meig.), TERPHIS *Erichs.* and PHILOPOTA *Wied.*

The N. A. species known to me belong to the genera: I. *Cyrtina:* 1. CYRTUS *Latr.*, 2. OCNÆA *Erichs.*, 3. PTERODONTIA *Griff.*, 4. ACROCERA *Meig.*, 5. a genus hitherto unnamed, and related to *Obsebius*, 6. EULONCHUS *Gerst.*, occurring in California. II. *Oncodina:* 7. ONCODES *Latr.*

FAM. XVII. HIRMONEURIDAE.

Charact.—Three basal cells much prolonged; veins of the wings varying; third longitudinal vein furcate; the two intercalary veins present. Third joint of the antennæ simple; terminal bristle simple or similar to a style, and consisting of several joints. Tibiæ without terminal spurs; empodium pulvilliform, but more frequently minute as well as the pulvilli.

This family, usually called *Nemestrinidæ*, must be divided into the two sections HIRMONEURINA and RHYNCHOCEPHALINA. The first comprises the genera: HIRMONEURA *Meig.*, EXERETONEURA

Macq., **Colax** *Wied.*, **Trichopsidea** *Westw.*, and **Symmictus** *Loew*, all of which are characterized by their very short proboscis. To the second belong the genera: **Fallenia** *Meig.*, **Nemestrina** *Wied.*, **Megistorhynchus** *Macq.*, **Trichophthalma** *Westw.*, and **Rhynchocephalus** *Fisch.*

We are only acquainted with a single N. A. species belonging to **Hirmoneura** *Meig.*

Fam. XVIII. MIDASIDAE.

Charact.—Three basal cells much prolonged; third longitudinal vein furcate; posterior intercalary vein always present, whereas the anterior one is often wanting; veins of the wings varying; wings naked. Antennæ clavate with the third joint consisting of several distinct segments. Under lip fleshy. Empodium very little developed.

To this family belong the genera: **Midas** *Fabr.*, **Cephalocera** *Latr.*, **Rhopalia** *Macq.*, and **Dolichogaster** *Macq.*—**Pomacera** *Macq.* may also be placed here till its true place is found.

The N. A. species hitherto known belong only to the genus **Midas** *Fabr.*

Fam. XIX. ASILIDAE.

Charact.—Three basal cells much prolonged. Third longitudinal vein of the wings furcate, the two intercalary veins always present. Third joint of the antennæ simple; under lip forming a horny sheath; empodium similar to a horny bristle.

This family, rich in species of the most varied forms, is divided into three sections. The first of them is that of the **Dasypogonina**, differing from the two others by its second longitudinal vein running into the border of the wing, whereas in the others it unites with the first longitudinal vein before the border of the wing. The considerable number of genera requires a further division into two subordinate groups, the first of which comprises those genera in which the anterior tibiæ end in a hooked spine, whereas the genera of the second portion have no such spine. Consequently the genera belonging to the first group of *Dasypogonina* are as follows: **Dasypogon** *Meig.*, **Saropogon** *Loew*, **Lastaurus** *Loew*, **Morimna** *Walk.*, **Cyrtophrys** *Loew*, **Laparus** *Loew*, **Brachyrhopala** *Macq.*, **Cheilopogon** *Rond.*, **Lagodias** *Loew*, and **Pege-**

SIMALLUS *Loew.* Those of the second group are: MICROSTYLUM *Macq.*, MEGAPOLLION *Walk.*, XIPHOCERUS *Macq.*, DOLICHODES *Macq.*, DISCOCEPHALA *Macq.*, SENOBASIS *Macq.*, PLESIOMMA *Macq.*, STENOPOGON *Loew*, BATHYPOGON *Loew*, HABROPOGON *Loew*, HOLOPOGON *Loew*, ERIOPOGON *Loew*, HETEROPOGON *Loew*, ISOPOGON *Loew*, OLIGOPOGON *Loew*, STICHOPOGON *Loew*, SAROPOGON *Loew*, DICRANUS *Loew*, TRICLIS *Loew*, EUARMOSTUS *Walk.*, PROLEPSIS *Walk.*, CODULA *Macq.*, CABASA *Walk.*, PHELLUS *Walk.*, PHILAMMOSIUS *Walk.*, GASTRICHELIUS *Rond.*, DACTILISCUS *Rond.*, ELASMOCERA *Rond.*, PHENEUS *Walk.*, CROBILOCERUS *Loew*, PYCNOPOGON *Loew*, ANAROLIUS *Loew*, AONEPHALUM *Macq.*, SISYRNODYTES *Loew*, RHADINUS *Loew*, CERATURGUS *Wied.*, DIOCTRIA *Meig.*, TERATOPUS *Loew*, DASPLETIS *Loew*, LAPHYCTIS *Loew*, SCYLATICUS *Loew*, HYPENETES *Loew*, SPANURUS *Loew*, RHABDOGASTER *Loew*, DAMALIS *Wied.*, LEPTOGASTER *Meig.* (= *Gonypes* Latr.), EUSCELIDIA *Westw.*, and LASIOCNEMUS *Loew.*

The second section of the *Asilidæ* are the LAPHRINA; it agrees with the third in the second longitudinal vein running into the first, but differs from it in the style of the antennæ either being thick and stout, and generally only rudimentary, or entirely wanting, whereas the antennæ of the third section possess a distinct terminal bristle. The genera of the second section are: LAPHRIA *Meig.*, LAMPRIA *Macq.*, HOPLISTOMERA *Macq.*, MEGAPODA *Macq.*, RHOPALOGASTER *Macq.*, MICHOTAMIA *Macq.*, ATOMOSIA *Macq.*, LAXENECERA *Macq.*, TAPINOCERA *Macq.*, PHONEUS *Macq.*, LAPHYSTIA *Loew*, NUSA *Walk.*, SCANDON *Walk.*, DASYLLIS *Loew*, LAMYRA *Loew*, LAMPROZONA *Loew*, DASYTHRIX *Loew*, THEREUTRIA *Loew*, AMPYX *Walk.*, CORMANSIS *Walk.*, CHŒRADES *Walk*, ACURANA *Walk.*, PSEUDORUS *Walk.*, POGONOSOMA *Rond.*, and DYSERIS *Loew.*

The third section is that of the ASILINA, which is characterized by its second longitudinal vein running into the first, and by its antennæ having a distinct terminal bristle. The genera belonging to this section are: MALLOPHORA *Macq.*, PROMACHUS *Loew*, ALCIMUS *Loew*, PHILODICUS *Loew*, CRASPEDIA *Macq.* (= *Blepharotes* Westw.), POLYPHONIUS *Loew*, APOCLEA *Macq.*, ERAX *Macq.*, ERISTICUS *Loew*, PROCTACANTHUS *Macq.*, STENOPROSOPIS *Macq.*, SYNOLCUS *Loew*, DYSCLYTUS *Loew*, LOPHONOTUS *Macq.*, TRIOHONOTUS *Loew*, DASOPHRYS *Loew*, PROTOPHANES *Loew*, DYSMACHOS *Loew*, EUTOLMUS *Loew*, MACHIMUS *Loew*, MOCHTHERUS *Loew* (= *Helig-*

moneura Big.), STILPNOGASTER *Loew*, EPITRIPTUS *Loew*, ITAMUS *Loew*, TOLMERUS *Loew*, CERDISTUS *Loew*, PROAGONISTES *Loew*, ASILUS *Linn.*, ECCOPTOPUS *Loew*, RHADIURGUS *Loew*, PAMPONERUS *Loew*, ANTIPHRISSON *Loew*, ECHTHISTUS *Loew*, ANTIPALUS *Loew*, PHILODICUS *Loew*, LECANIA *Macq.*, ATRACTIA *Macq.*, and OMMATIUS *Wied.*

Most of the N. A. *Asilidæ*, but by no means all, may be placed in the genera hitherto established. I give, as far as I am able to do so under such circumstances, the following list of genera known to me as occurring on that continent:—

I. *Dasypogonina:* 1. DASYPOGON *Meig.*, with several species which will require the formation of some new genera; 2. MICROSTYLUM *Macq.*, 3. DISCOCEPHALA *Macq.*, 4. PLESIOMMA *Macq.*, 5. STENOPOGON *Loew*, 6. BATHYPOGON *Loew*, 7. LASTAURUS *Loew*, 8. EUARMOSTUS *Walk.*, 9. PHENEUS *Walk.*, 10. STICHOPOGON *Loew*, 11. CERATURGUS *Walk.*, 12. LEPTOGASTER *Meig.* The N. A. species recorded as belonging to DIOCTRIA *Meig.* are no *Dioctriæ* at all; at least DIOCTR. OCTOPUNCTATA *Say* is by no means a true *Dioctria*.

II. *Laphrina:* 13. MEGAPODA *Macq.*, 14. LAPHRIA *Meig.*, 15. ANDRENOSOMA *Rond.*, 16. LAMPRIA *Macq.*, 17. ATOMOSIA *Macq.*, 18. LAPHYSTIA *Loew.*

III. *Asilina:* 19. MALLOPHORA *Macq.*, 20. PROMACHUS *Loew*, 21. ERAX *Macq.*, 22. PROCTACANTHUS *Macq.*, 23. MOCHTHERUS *Loew*, 24. EPITRIPTUS *Loew*, 25. OMMATIUS *Wied.*

FAM. XX. THEREUIDAE.

Charact.—Three basal cells much prolonged; the two intercalary veins present; third longitudinal vein furcate. Antennæ with a terminal style of variable form, sometimes wanting. No empodium. Under lip fleshy.

The principal genera belonging to this family are: XESTOMYZA *Wied.*, BARYPHORA *Loew*, CIONOPHORA *Egg.*, EXAPATA *Macq*, THEREUA *Latr.*, ECTINORHYNCHUS *Macq.*, ANABARHYNCHUS *Macq.*, TABUDA *Walk.*, CYCLOTELUS *Walk.*, PHYCUS *Walk.*, and DIMASSUS *Walk.*

The N. A. species with which I am acquainted may be conveniently placed under the genus THEREUA *Latr.* In case the genus

Psilocephala Zett., which does not appear to be well founded, should be admitted, some species with naked faces would be located in it.

Fam. XXI. BOMBYLIDAE.

Charact.—Three basal cells much prolonged; anterior intercalary vein present almost without exception, the posterior always wanting; third joint of the antennæ simple; empodium quite rudimentary.

This, again, is a family exceedingly rich in the most varied forms. A distribution into several tribes would therefore be very useful; the two sections hitherto adopted, one of which comprises the genera grouped round the genus *Bombylius*, having a long proboscis, while the second consists of genera more allied to the genus *Anthrax*, having a short proboscis, do not appear sufficient to embrace all the forms which have hitherto been discovered. I am unable to give a better distribution, and I think it will not be possible to do so until the number of sections is increased to at least five or six. The genera of *Bombylidæ* are as follows: Bombylius *Linn.*, Eurycarenus *Loew*, Triplasius *Loew*, Systœchus *Loew*, Sparnopolius *Loew*, Dischistus *Loew* (= *Bombylisoma* Rond.), Parisus *Walk.*, Choristus *Walk.*, Heterostylum *Macq.*, Lasioprosopa *Macq.*, Adelidea *Macq.*, Acreotrichus *Macq.*, Apatomyza *Wied.*, Thlipsomyza *Meig.*, Amictus *Wied.*, Megapalpus *Macq.*, Phthiria *Meig.*, Cyclorhynchus *Macq.*, Dasypalpus *Macq.*, Crocidium *Loew*, Geron *Meig.*, Apolysis *Loew*, Oligodranes *Loew*, Mulio *Latr.* (= *Glossista* Rond.), Chalcochiton *Loew*, Callostoma *Macq.*, Sericosoma *Macq.*, Toxophora *Meig.*, Eniconeura *Macq.*, Lepidophora *Macq.*, Corsomyza *Wied.*, Eclimus *Loew*, Systropus *Wied.*, Dolichomyia *Wied.*, Usio *Latr.*, Platypygus *Loew*, Cyrtosia *Perr.*, Pleas *Latr.*, Cyllenia *Latr.*, Lagochilus *Loew*, Anisotamia *Macq.*, Lomatia *Meig.*, Oncodocera *Macq.*, Plesiocera *Macq.*, Ligyra *Newm.*, Anthrax *Scop.*, Argyromœba *Schin.*, Neuria *Newm.*, Comptosia *Macq.*, Litorhynchus *Macq.*, Spogostylum *Macq.*, Enica *Macq.*, Tomomyza *Wied.*, Argyrospila *Rond.*, Exoprosopa *Macq.*, Autonia *Loew*.

The N. A. *Bombylidæ* which I have seen may be distributed amongst the following genera: 1. Bombylius *Linn.*, 2. Systœchus *Loew*, 3. Sparnopolius *Loew*, 4. Lepidophora *Westw.*, 5. Toxophora *Meig.*, 6. Geron *Meig.*, 7. Systropus *Wied.*, 8. Ploas

Latr., 9. ANTHRAX *Scop.*, 10. ARGYROMŒBA *Schin.*, 11. EXOPROSOPA *Macq.*

Moreover, Macquart has founded his genus *Oncodocera* on a N. A. species, and described a N. A. species among his *Anisotamiæ*, though it seems to be an alien there. Mr. Walker described some N. A. species, which he placed under the genera *Apatomyza* Wied. and *Phthiria* Meig.

FAM. XXII. SYRPHIDAE.

Charact.—Three basal cells much prolonged; third longitudinal vein simple; a spurious longitudinal vein (*vena spuria*) between the third and fourth longitudinal veins; fourth longitudinal vein united at its end with the third; no intercalary veins. Hypopygium unsymmetrical; no empodium.

This is one of the most extensive families and includes about eighty genera, the enumeration of which seems to be superfluous here. A distribution into sections, however desirable, proves exceedingly difficult. To divide the family into genera with an antennal bristle and genera with a terminal style would be no great gain, since the number of the latter is very small.

I know the following genera to occur in N. A.: VOLUCELLA *Geoffr.*, TEMNOCERA *St. Farg.*, MICRODON *Meig.* (= *Aphritis* Latr.), CERIA *Fabr.*, SERICOMYIA *Meig.*, TROPIDIA *Meig.*, SYRITTA *St. Farg.*, XYLOTA *Meig.*, MALLOTA *Meig.*, BRACHIPALPUS *Macq.*, MILESIA *Latr.*, SPHECOMYIA *Latr.*, SOMULA *Macq.*, CHRYSOTOXUM *Meig.*, MIXTEMYIA *Macq.*, MALLOTA *Meig.*, HELOPHILUS *Meig.*, ERISTALIS *Latr.*, PLAGIOCERA *Macq.*, OCYPTAMUS *Macq*, BACCHA *Fabr.*, SPHEGINA *Meig.*, RHINGIA *Fabr.*, ORTHONEURA *Macq.* (= *Cryptineura* Big.), PARAGUS *Latr.*, CHEILOSIA *Meig.*, CHRYSOCHLAMYS *Rond.*, DOROS *Meig.*, DIDEA *Macq.* (= *Enica* Meig.), MELITHREPTUS *Loew* (= *Sphærophoria* Macq.), MESOGRAMMA *Loew*, SYRPHUS *Fabr.*, SCÆVA *Fabr.*, PLATYCHEIRUS *St. Farg.*

It results from the remarks of some authors that species of the genera: *Pipiza* Fall., *Chrysogaster* Meig., *Epistrophe* Walk., *Polydonta* Macq., and *Merodon* Latr. occur with certainty in N. A.

The genus *Chymophila* Macq. founded on a N. A. species must be entirely blotted out from the list of genera. For it is evident that Bigot is right in stating that the specimen on which it was founded was a composition of a body of a *Microdon* with the head of a *Conops*. The genus *Toxomerus* Macq. has not been mentioned in the above list, it being quite untenable. I judge *Dimeraspis* Newm. to be identical with *Microdon*. *Psarus* has been omitted, because the species described under this name must be placed in other genera. The statement of *Eumerus* Meig. occurring in N. A. is founded merely on an observation of Walker, and therefore requires further confirmation. Macquart records a N. A. species of the genus *Psilota* Meig., but this genus having been misunderstood by most authors, I do not venture now to mention it among those truly represented in N. A.

FAM. XXIII. MYOPIDAE.

Charact.—Three basal cells large, the third closed, more or less remote from the posterior border; all longitudinal veins simple; no intercalary vein. Eyes in both sexes broadly separated; proboscis, with few exceptions, much prolonged; maxillæ small; the third joint of the antennæ with an apical style or a thick dorsal bristle. Hypopygium symmetrical, turned under the abdomen. Empodium wanting.

Omitting the untenable genera into which the genus *Conops* has been subdivided by Rondani and the genus *Myopa* by Perris, we mention here the genera: CONOPS *Linn.*, PLEUROCERINA *Macq.*, ZODION *Latr.*, MYOPA *Latr.* and STACHINIA *Macq.*

This family has been divided by some authors into two families: *Conopidæ* and *Myopidæ*, the former containing those genera which have an apical style on the antennæ, the latter being characterized by a dorsal bristle of the antennæ. I cannot approve of this division at all, since the difference between a style and a bristle, and the difference of an apical and a dorsal position, according to all experience, only furnishes characters of very inferior value for the systematic arrangement, as we see in the families *Stratiomydæ*, *Bombylidæ*, *Syrphidæ*, *Hybotidæ*, *Dolichopidæ*, etc., where this organ is sometimes apical, sometimes dorsal. We might as well form two families on account of the proboscis being either straight or geniculated. But the conspicuity of the difference in the structure of the antennæ may serve to form two sections in the family, CONOPINA and MYOPINA, the former of which would contain the genera *Conops* and *Pleurocerina*, the latter the genera *Zodion*, *Myopa*, and *Stachynia*.

The N. A. species which I know belong to the genera: 1. CONOPS *Linn.*, 2. ZODION *Latr.*, 3. MYOPA *Latr.*, 4. STACHYNIA *Macq.*

FAM. XXIV. PIPUNCULIDAE.

Charact.—Three basal cells much prolonged, the hindmost closed near the border of the wing; third longitudinal vein simple, the fourth sometimes almost entirely wanting, sometimes furcate when perfect; no intercalary vein. Head almost entirely occupied by the eyes, front and face exceedingly narrow; antennæ with a basal bristle. Hypopygium unsymmetrical. Tibiæ without spurs; empodium wanting.

This family only comprises the three genera: NEUROPHOCERUS *Zett.*, PIPUNCULUS *Latr.* and CHALARUS *Walk.*

The N. A. species known to me belong all to the genus PIPUNCULUS *Latr.*

FAM. XXV. SCENOPINIDAE.

Charact.—Three basal cells very large; the third closed rather far from the border of the wing; third longitudinal vein furcate; no intercalary vein; third joint of the antennæ without style or bristle. No empodium.

This family possesses so many peculiarities that it is very difficult to find a fit place for it among the other families, though it exhibits much affinity with some of them. I would especially point out the *Bombylidæ* as deserving a closer comparison in order to investigate their true relationship. At present it seems best to follow those authors who have considered the genus SCENOPINUS as the type of a separate family.

Some species of SCENOPINUS occur in N. A.

FAM. XXVI. PLATYPEZIDAE.

Charact.—Three basal cells rather large, the hindmost always ending acutely, at more or less distance from the border of the wing; third longitudinal vein simple; no intercalary vein. Antennæ with an apical bristle. Hypopygium symmetrically turned under the abdomen. Middle tibiæ with spurs; empodium wanting.

The genera which belong to this family are: PLATYPEZA *Meig.*, CALLOMYIA *Meig.*, OPETIA *Meig.*, and PLATYCNEMA *Zett.*

I know only one species of PLATYCNEMA, one species of CALLOMYIA, and two species of PLATYPEZA occurring in N. A.

FAM. XXVII. LONCHOPTERIDAE.

Charact.—Three basal cells of moderate size, of nearly equal length; fourth longitudinal vein furcate and united with the fifth near the base. Antennæ with an apical bristle. Empodium wanting.

This family is also founded on a single genus which cannot be placed in any other family. Though in LONCHOPTERA the basal cells are by no means large, yet their structure and the great development of the sixth longitudinal vein seems to prove that this family should be reunited with one of those already mentioned. However, by the form of its neuration and its anal parts it differs so widely from them, that it is very difficult to state in what their affinity consists. Mr. Walker has lately added the genus CADREMA to the family of *Lonchopteridæ*.

LONCHOPTERA is found in N. A.

FAM. XXVIII. HYBOTIDAE.

Charact.—Three basal cells complete, rather large, the third only a little shorter than the second; posterior transverse vein of the base generally running perpendicularly or at a somewhat acute angle into the sixth longitudinal vein, and thus not being parallel to the posterior border of the wing; third longitudinal vein frequently furcate; anterior intercalary vein often wanting, posterior never present. First joint of the antennæ not much shortened, the third more frequently with a bristle than with a style, the bristle sometimes dorsal instead of being apical. Empodium membranaceous and linear.

The three families: *Hybotidæ*, *Empidæ* and *Tachydromidæ* run into each other so insensibly, that it is very difficult to indicate sharp limits between them. If we select this or that character as being of greater importance, we shall always obtain a different result as to these limits. I maintain the family *Hybotidæ* only with the view of falling in with the usual arrangement, since I am fully satisfied that there is no sharp limit to be drawn between it and that of the *Empidæ*. For neither the more convex thorax, nor the horizontal direction of the proboscis, nor the form and position of the palpi, nor the simplicity or furcation of the third longitudinal vein, nor the presence or absence of the anterior intercalary vein are characters, on which—whether we use them singly or in any combination—we can found a satisfactory or sharp definition of both families. The resemblance of some *Hybotidæ* with some *Bombylidæ* cannot be denied, but their place will never be doubtful if we consider, that in the *Bombylidæ* the third basal cell is open or only closed near the border of the wing, while in all *Hybotidæ* it always remains remote from that border. To the family *Hybotidæ* may be referred: BRACHYSTOMA *Meig.*, HYBOS *Fabr.*, SYNECHES *Hal.* (= *Pterospilus* Rond. = *Harpamerus* Big.), SYNDYAS *Loew*, STENOPROCTUS *Loew*, ACARTERUS *Loew*, MEGHYPERUS *Loew*, OEDALEA *Meig.*, EUTHYNEURA *Macq.* (= *Anthalia* Zett.), OCYDROMIA *Meig.*, TRICHOPEZA *Rond.* on account of of its near relation with *Brachystoma* and LEPTOPEZA *Macq.* on account of its resemblance with *Ocydromia*. The two last genera might as well be placed among the *Empidæ*, since they agree with them in having the posterior basal transverse vein parallel to the border of the wing.

The N. A. species which I possess belong to the following genera: BRACHYSTOMA *Meig.*, HYBOS *Fabr.*, SYNECHES *Walk.*, SYNDYAS *Loew*, and LEPTOPEZA *Macq.* Mr. Walker also describes a species which he believes to belong to the genus OCYDROMIA *Meig.*

FAM. XXIX. EMPIDAE.

Charact.—Three basal cells complete, rather large, the third shorter than the second; posterior basal transverse vein parallel to the border of the wing; third longitudinal vein frequently furcate; anterior intercalary vein present, the posterior wanting. First joint of the antennæ not much shortened, third joint with an apical bristle sometimes resembling a style. Empodium membranaceous and of a linear form.

The genera belonging to this family are: EMPIS *Meig.*, PACHYMERIA *Macq.*, ERIOGASTER *Macq.*, APLOMERA *Macq.*, RHAMPHOMYIA *Meig.*, HILARA *Meig.*, RAGAS *Walk.*, GLOMA *Meig.*, MICROPHORUS *Macq.*, HORMOPEZA *Zett.*, ITEAPHILA *Zett.*, MICROSANIA *Zett.*, and CYRTOMA *Meig.*

The N. A. species known to me belong to the genera: EMPIS *Meig.*, PACHYMERIA *Macq.*, RHAMPHOMYIA *Meig.*, HILARA *Meig.*, and CYRTOMA *Meig.* Mr. Walker records a N. A. species belonging to the genus GLOMA *Meig.*

FAM. XXX. TACHYDROMIDAE.

Charact.—The hindmost basal cell not always present, the second basal cell sometimes coalescent with the discal cell; when present they are of a tolerable size, but the hindmost is always remote from the border of the wing; third longitudinal vein sometimes furcate; anterior intercalary vein sometimes present, the posterior never. First joint of the antennæ very much shortened so that the antennæ may easily be taken for biarticulate. Empodium membranaceous and of a linear form.

To this family belong the genera: HEMERODROMIA *Meig.* with CHYROMANTIS *Rond.* and MANTIPEZA *Rond.*, PHYLLODROMIA *Zett.*, TACHYDROMIA *Fabr.*, DRYODROMIA *Rond.*, ELAPHROPEZA *Macq.*, PLATYPALPUS *Macq.*, PHOROXYPHA *Rond.*, SCIODROMIA *Hal.* (= *Microcera* Zett.), ARDOPTERA *Macq.* (= *Leptosceles* Hal.), CLINOCERA *Meig.*, with which HELEODROMIA *Hal.* (= *Paramesia* Macq.,) and WIEDEMANNIA *Zett.* may be properly reunited.

As genera occurring in N. A. I enumerate: HEMERODROMIA *Meig.*, TACHYDROMIA *Fabr.*, PLATYPALPUS *Macq.*, ARDOPTERA *Macq.*, and CLINOCERA *Meig.* If we may trust Mr. Walker's statement, the genus DRAPETIS *Meig.* also occurs in N. A.

Observation.—With the *Tachydromidæ* ends the series of those families of *Brachycera* which in the greater development of their basal cells differ from the following, and, with the exception of the *Lonchopteridæ*, form a rather natural series, if a linear arrangement may be spoken of as a natural one. The peculiarities, which also characterize this series of families, and any of which, combined with that just mentioned, suffice to place a family under this head, are the following: 1. the third joint of the antennæ is composed of a number of joints more or less soldered together; 2. the third longitudinal vein is furcate; 3. one intercalary vein or both are present; 4. the empodium is considerably developed. These peculiarities characterizing the whole series of families hitherto spoken of are much lessened in the *Hybotidæ* and *Empidæ*, and still more so in the *Tachydromidæ*. *Tæniaptera*, *Dacus* and other genera with the third basal cell more developed, are placed by most of the authors lower down in the series of families which follow. In order to retain the accustomed arrangement as much as possible, I shall leave them in their usual places, though it would seem, that a more natural arrangement might be obtained, were they added to the above families which have the basal cells prolonged.

FAM. XXXI. DOLICHOPODIDAE.

Charact.—First basal cell rather short, the second united with the discal cell, the third small; auxiliary vein running in the first longitudinal vein; third longitudinal vein simple, the fourth sometimes furcate; no intercalary vein. Hypopygium symmetrical, bent under the abdomen. Empodium small, membranaceous, of a linear form.

The principal genera are: PSILOPUS *Meig.*, SYBISTROMA *Meig*, HYPOPHYLLUS *Hal.*, HERCOSTOMUS *Loew*, HYGROCELEUTHUS *Loew*, DOLICHOPUS *Meig.*, TACHYTRECHUS *Stann.*, ORTHOCHILE *Latr.*, GYMNOPTERNUS *Loew*, LYRONEURUS *Loew*, PLAGIONEURUS *Loew*, LIANCALUS *Hal.*, SCELLUS *Loew*, HYDROPHORUS *Fall.*, CAMPSICNEMUS *Hal.*, THINOPHILUS *Wahlb.*, PEODES *Loew*, ACHALCUS *Hal.*, SYSTENUS *Loew*, SYNTORMON *Loew*, SYNARTHRUS *Loew*, PORPHYROPS *Meig.*, RHAPHIUM *Meig.*, XIPHANDRIUM *Hal.*, HALTERICERUS *Rond.*, SMILIOTUS *Loew* (= *Machærium* Hal.), ARGYRA *Macq.*, LEUCOSTOLA *Hal.*, NEMATOPROCTUS *Loew*, SAUCROPUS *Loew*, XANTHOCHLORUS *Loew*, SYMPYCNUS *Loew*, TEUCHOPHORUS *Loew*, ANEPSIUS *Loew*, EUTARSUS *Hal.*, DIAPHORUS *Meig.*, CHRYSOTUS *Meig.*, CHRYSOTIMUS *Hal.*, MEDETERUS *Fisch.*, APHROSYLUS *Hal.*

The N. A. genera which I am acquainted with are: PSILOPUS *Meig.*, HYGROCELEUTHUS *Loew*, DOLICHOPUS *Meig.*, TACHYTRECHUS *Stann.*, GYMNOPTERNUS *Loew*, PLAGIONEURUS *Loew*, LIANCALUS *Hal.*, SCELLUS *Loew*, CAMPSICNEMUS *Hal.*, SYNARTHRUS *Loew*, PORPHYROPS *Meig.*, ARGYRA *Macq.*, LEUCOSTOLA *Hal.*, SAUCROPUS *Loew*, XANTHOCHLORUS *Loew*, DIAPHORUS *Meig.*, LYRONEURUS *Loew*, CHRYSOTUS *Meig.*, and MEDETERUS *Fisch.*

FAM. XXXII. OESTRIDAE.

Charact.—Antennæ inserted in rounded pits; the middle part of the face exceedingly narrow; the opening of the mouth very small; the oral organs rudimentary. Tegulæ large.

This family has often been considered as very distant from the following, but the late discoveries have brought to light forms which are more nearly related to them. The following genera may be taken for those which constitute the family: TRYPODERMA *Wied.* (= *Cuterebra* Clark), CEPHALOMYIA *Latr.*, CEPHENEMYIA *Latr.*, HYPODERMA *Clark*, GASTRUS *Meig.*, AULACEPHALA *Macq.* and CTENOSTYLUM *Macq.* A thorough limitation of these genera is still wanted, and the name of *Oestrus*, instead of being dropped, as we see it done by some authors, may perhaps be again restored to its former rank.

I have seen N. A. species of the genus TRYPODERMA, and others of the genera CEPHALOMYIA and GASTRUS, introduced in America from Europe. There is no doubt that species of HYPODERMA occur there also.

FAM. XXXIII. DEXIDAE.

Charact.—Bristle of the antennæ hairy or pectinated. Thorax short. First posterior cell of the wing slightly opened, sometimes closed. Tegulæ large. Legs long.

The family *Dexidæ* agrees with the *Tachinidæ*, *Sarcophagidæ*, *Muscidæ*, and *Anthomyidæ*, in having the tegulæ larger than any of the following families of the *Brachycera*. These five families have been therefore united under the name of *Muscariæ calyptratæ*, and contrasted with the following, called *Muscariæ acalyptratæ*. There is no possibility, it seems, to discover any other constant character; that which appears the most serviceable was pointed out to me by Mr. Haliday; it is the transverse suture of the thorax being usually of the same depth on its whole extent in the *Muscariæ calyptratæ*, whereas in the *Muscariæ acalyptratæ* it is generally distinct at each side and imperceptible on the middle of the thorax. But as some families among the so-called *Muscariæ acalyptratæ* have the tegulæ so well developed as to resemble those of many *Anthomyidæ*, a high importance cannot be attached to that subdivision. Should it be maintained, the *Oestridæ* ought to be placed among the *Muscariæ calyptratæ*.

The four families: *Dexidæ*, *Tachinidæ*, *Sarcophagidæ*, and *Muscidæ*, agree in the first posterior cell being very much narrowed or closed at the end, and differ in this from the family *Anthomyidæ*. The former have, for this reason, been comprised under the common name of *Creophilæ*, in opposition to the latter, which received the name of *Anthophilæ*. The differences in the organization of the *Muscariæ calyptratæ* are much smaller than those of any two families among the first series of *Diptera brachycera*, which ends with the *Tachydromidæ*, with the sole exception of the group formed by the *Hybotidæ*, *Empidæ*, and *Tachydromidæ*, in which a similar relationship exists. Consequently the families in question here owe their existence much more to the immense number of species and genera than to a real necessity, based on differences of structural characters. Hence it is much more difficult to define their limits, and one must already be well acquainted with a great number of forms, in order to attempt to point out with certainty the right place for new ones. In the limitation of these families I have made use of what has been said about them in Walker's British Diptera; for however insufficient I may find it, I know of nothing better to be put in its place.

In the family of *Dexidæ* a number of genera have been already formed; as they still require considerable sifting and a much sharper limitation than they have at present, it seems useless to enumerate them here.

The N. A. *Dexidæ* known to me cannot all be placed in the genera hitherto erected. The species about whose position there is no doubt belong to the genera: PROSENA *St. Farg.*, MICROPHTHALMA *Macq.*, DINERA *Rob. Desv.*, and ESTHERIA *Rob. Desv.* There is also no doubt about TRICHODURA *Macq.* and MEGAPROSOPUS *Macq.* occurring in N. A.

FAM. XXXIV. TACHINIDAE.

Charact.—**Bristle of the antennæ bare or with a very short pubescence. Thorax short. First posterior cell closed or only slightly opened. Legs short.**

The immense extent of this family renders the formation of sections indispensable. It is best divided into four sections, which might perhaps be raised into families. The two first of them are the *Tachinina* and *Ocypterina*, both of which differ from the two last by their abdomen being beset with long bristles. All TACHININA have an oval abdomen, or when it is nearly cylindrical, its first segment is much shortened. The abdomen of the OCYPTERINA is always of a slender cylindrical form, and its first segment elongated.

The third section, the GYMNOSOMINA, has a broad front and a vaulted abdomen. The fourth is that of the PHASINA, having a very narrow front and a flat abdomen.

My knowledge of the N. A. *Tachinidæ* is a very incomplete one. I know, however, the following genera: I. *Tachinina:* 1. DEJEANIA *Rob. Desv.*, 2. ECHINOMYIA *Meig.*, 3. JURINEA *Rob. Desv.*, 4. HYSTRICIA *Macq.*, 5. MICROPALPUS *Macq.*, 6. GONIA *Meig.*, 7. NEMORÆA *Rob. Desv.*, 8. BLEPHARIPEZA *Macq.*, 9. BELVOISIA *Rob. Desv.*, 10. TACHINA *Meig.*, 11. CHRYSOSOMA *Macq.*, 12. METOPIA *Meig.*, 13. MILTOGRAMMA *Meig.*, 14. ILLIGERA *Rob. Desv.*, 15. MASICERA *Macq.* II. *Ocypterina:* 16. OCYPTERA *Latr.* III. *Gymnosomina:* 17. GYMNOSOMA *Fall.* IV. *Phasina:* 18. PHASIA *Latr.* 19. HYALOMYIA *Macq.*, 20. TRICHOPODA *Latr.*

FAM. XXXV. SARCOPHAGIDAE.

Charact.—Bristle of the antennæ plumose or hairy, with the apex bare. First posterior cell only slightly opened or else closed. Tegulæ large. Legs stout.

All the N. A. species I have seen belong to the genera: SARCOPHAGA *Meig.*, PHRYSSOPODA *Rob. Desv.*, and CYNOMYIA *Meig.*

FAM. XXXVI. MUSCIDAE.

Charact.—Bristle of the antennæ entirely plumose or pectinated. Body never slender; thorax short. First posterior cell only slightly opened or else closed at the border of the wing. Tegulæ large. Legs stout.

This family contains two sections: the MUSCINA with plumose antennæ, and the STOMOXYNA with pectinated antennæ.

The N. A. species which I have examined belong to the genera: MUSCA *Linn.*, POLLENIA *Rob. Desv.*, CYRTONEURA *Macq.*, PYRELLIA *Rob. Desv.*, LUCILIA *Rob. Desv.*, CALLIPHORA *Macq.*, and STOMOXYS *Geoffr.* The number of species which N. A. has in common with Europe is exceedingly striking in this particular family.

FAM. XXXVII. ANTHOMYIDAE.

Charact.—Thorax with a complete transverse suture. Fourth longitudinal vein straight or nearly so, hence first posterior cell fully open. Tegulæ rather well developed, though in many cases of no large size.

The riches of the N. A. Fauna in this family have been very little explored. I know species of the following genera only: ANTHOMYIA *Meig.*, HOMALOMYIA *Bouch.*, HYLEMYIA *Macq.*, ARICIA *Rob. Desv.*, LISPE *Latr.*, and CŒNOSIA *Meig.* The notices of Mr. Walker about the occurrence of some species of *Eriphia* and of one *Dialyta* appear to me very uncertain.

FAM. XXXVIII. CORDYLURIDAE.

Charact.—Neuration of the wings complete; both posterior basal cells of considerable size; auxiliary vein well separated from the first longitudinal vein; first longitudinal vein bare. Whole lateral border of the front bristly; anterior border of the mouth with strong, usually numerous vibrissæ. Tibiæ with spurs.

With the *Cordyluridæ* we begin that division of *Diptera* which is called *acalyptratæ*, and the systematical arrangement of which is still and will be an unsolved problem, till their structure has been much more thoroughly studied than has been hitherto the case. In the present state of our knowledge their subdivision into a greater number of families seems to be the most advisable course to pursue.

As for their exterior, the *Cordyluridæ* mostly approach to the *Anthomyidæ*, and namely to the species of the genus *Coenosia*, but the smaller size of their tegulæ and the less incomplete development of the transverse suture on their thorax serve to distinguish them. On the other side they are closely allied to the *Helomyzidæ*, in which, however, the front bears bristles on its upper half only, the two posterior basal cells are smaller, and the costa of the wings is always bristly.

N. A. possesses species of CORDYLURA, some of them very interesting, and a number of SCATOPHAGÆ among which several coincide with European species.

FAM. XXXIX. HELOMYZIDAE.

Charact.—Neuration of the wings complete; costa bristly; first longitudinal vein not abbreviated, but bare: the auxiliary vein is often rather approximated to it. Front bristly on its upper half only; a stout bristle at each side of the anterior border of the mouth. All the tibiæ with spurs and outwards before their tips with a more or less developed erect bristle.

The close relation of the *Helomyzidæ* to the *Cordyluridæ* induces me to assign them a place here, although the consideration of the smaller size of their two posterior basal cells would remove them to a more distant place, in the neighborhood of the *Geomyzidæ* and *Heteroneuridæ*. In fact both families are related to the *Helomyzidæ;* but they differ from them by their having the first longitudinal vein abbreviated and the auxiliary vein lying close by it, and besides the *Heteroneuridæ* have the peculiarity of the costa of the wings being without bristles.

The known N. A. species belong to the genera HELOMYZA and SCHŒNOMYZA. Some of them are likewise identical with European species.

FAM. XL. SCIOMYZIDAE.

Charact.—Neuration of the wings complete; two posterior basal cells of rather considerable size; auxiliary vein well separated from the first longitudinal vein. On the lateral border of the front before the vertical bristles there are two bristles, one behind the other; face proportionately long without distinct furrows for the antennæ; border of the mouth sharp, without vibrissæ. Middle tibiæ with a greater number of bristles at the tip; all the tibiæ on the outside before the tip with a small upright bristle.

I know N. A. species that belong to the genera SEPEDON, TETANOCERA, and SCIOMYZA. Some of them are most nearly related to European species, others seem altogether identical with them. If we place, and we may well justify our doing so, the genus DRYOMYZA among the *Sciomyzidæ*, it must also be named as a genus represented in N. A.; one of the two species of this genus occurring there does not seem to differ from the European *Dryomyza anilis* Fall. The genus ACTORA *Meig.*, which agrees with the *Sciomyzidæ* in many characters, may be referred to them without any great difficulty; but on account of its deviation in the structure of the face, the character of the family would have then to be slightly altered. Mr. Walker has described a N. A. species which he contends to belong to ACTORA.

FAM. XLI. PSILIDAE.

Charact.—Body elongated, with short hairs and almost without bristles. Neuration of the wings complete; the auxiliary vein lies close by the first longitudinal vein, but diverges from it at its end and runs towards the border of the wing; by a transverse fold most characteristic in this family running from the tip of the auxiliary vein as far as the base of the third posterior cell, the outward end of the auxiliary vein is obliterated; the posterior basal cells are very large. Front with only a few bristles in the neighborhood of the crown; face receding; opening of the mouth small and with no bristles at its border. Only the middle tibiæ have spurs, and all the tibiæ are without erect bristle on the outside.

This family is represented in N. A. by the genera LOXOCERA, PSILA, and CHYLIZA. The N. A. species, which induced Mr. Walker to form a new genus *Prochyliza*, placed by him close by *Chyliza*, belongs to some other family.

FAM. XLII. MICROPEZIDAE.

Charact.—Body slender, elongated, with very short hairs and very scarce bristles. Legs proportionately short; only the middle tibiæ have spurs, these being generally very small and weak; no small erect bristle on the exterior side of the tibiæ. Neuration of the wings complete; first longitudinal vein bare; the auxiliary vein is very close by it and diverges from it towards its end only; the two posterior basal cells are very large. Front with some bristles in the neighborhood of the crown only; bordering of the mouth without vibrissæ. Last segment of the abdomen of the female prolonged into a blunt, cylindrical tube.

The family *Micropezidæ* comprises genera which differ among each other, both in the form of the head and the structure of the antennæ and oral parts. The head is sometimes rounded, sometimes more elongated; the bristle of the antennæ is generally dorsal, but in some genera apical; the clypeus sometimes very much developed, sometimes only rudimentary; the palpi sometimes large, sometimes small, but never rudimentary. The clypeus being very much developed and the proboscis very much thickened in the genus *Tæniaptera* Macq., this family approaches so much to the *Ortalidæ*, that the bareness of the first longitudinal vein, the difference in the structure of the female ovipositor, and the corresponding difference in the structure of the male appendages, must be considered as the chief characters, which distinguish it from them. The *Sepsidæ*, too, are rather nearly related to the *Micropezidæ*, but are distinguished from them not only by the structure of the female ovipositor, but also by their palpi being always rudimentary.

The N. A. species I know of are: one true CALOBATA, numerous TÆNIAPTERÆ, and two MICROPEZÆ. Whether the N. A. species which Mr. R. Desvoidy refers to the genus NERIUS, really belong to it, appears to me most doubtful, as they seem to be *Tæniapteræ* all together. The genus LISSA *Meig.* occurring likewise in N. A., in most characters agrees with the *Micropezidæ*, and may provisionally be placed among them, till a more convenient place in the system will be pointed out for it. The genus EUMETOPIA erected by Mr. Macquart on a N. A. species, is also related to the latter, and may likewise obtain here a provisional place. Both these genera differ from the great bulk of the *Micropezidæ* by having the legs less slender, the tarsi less abbreviated, and the last segment of the abdomen not prolonged so as to form a cylindrical tube.

FAM. XLIII. ORTALIDAE.

Charact.—Neuration of the wings complete; auxiliary vein separated from the first longitudinal vein and running to the border of the wing in the usual way, under an acute angle and remaining perfectly distinct in its whole length; third longitudinal vein generally with coarse hairs; two posterior basal cells large, and the outward one frequently prolonged in an acute angle. Front with bristles on the upper part only; no vibrissæ at the border of the mouth; clypeus commonly very much developed, and proboscis often very much thickened. Middle tibiæ alone with spurs; no tibiæ with an erect bristle on the exterior side before the tip. Ovipositor of the female rather flattened and horny, consisting of three elongated segments, forming three drawers like those of a telescope, and ending in a simple point.

The family of *Ortalidæ* is exceedingly rich in variously shaped organizations, which caused a considerable increase of genera in it. Unfortunately most of them are founded on characters so variable that they are of very little use, and it seems best to retain the old ample genera. We feel the more compelled to do so, as many species existing in N. A. cannot be referred to any of the modern genera.

The whole of the *Ortalidæ* may conveniently be divided into two sections: the first, which may be named **Tetanopina**, has the front more prominent, the face receding, the opening of the mouth rather small, the clypeus less developed, and the proboscis less thick; in the second, the **Ortalina**, the front is not prominent, the clypeus very much developed, the opening of the mouth much wider, and the proboscis much thicker.

The N. A. Fauna possesses in **Pyrgota** a genus of the first section, particularly striking, and even somewhat deviating. Among the other N. A. *Ortalidæ* known to me there is only one species belonging to **Cephalia**, whereas all the rest belong to the genus **Ortalis**, if we take it, as Meigen did, in a wider sense, and are distributed especially among the genera *Ceroxys*, *Ortalis*, *Rivellia* and *Delphinia*, of modern authors.

FAM. XLIV. TRYPETIDAE.

Charact.—Neuration complete; the end of the auxiliary vein runs steeply to the border of the wing and becomes obsolete; first longitudinal vein always with bristles, the third frequently, the fifth sometimes; two posterior basal cells rather large, the hindmost is often prolonged to a point. Front on each side with two rows of bristles, one of which is more above and interiorly, the other below and exteriorly. Border of the mouth with no vibrissæ. Clypeus none or rudimentary. Proboscis never incrassated. Only the middle tibiæ with spurs; all tibiæ without erect bristle on the outer side before the tip. Ovipositor horny, consisting of three elongated retractile segments like the drawers of a telescope, the last of which ends in a simple point.

They are divided into two sections, **Dacina** and **Trypetina**. In the former the female abdomen, before the ovipositor, has apparently only four segments, the fifth segment being diminutive and entirely concealed under the fifth; in the *Trypetina* the five segments are all equally developed.

As the *Dacina*, represented in Europe only by *Dacus Oleæ*, which lives on the olive-tree, and *Petalophora capitata*, exclusively dependent on the lemon-tree, are in all respects strangers in the European Fauna, so they appear to be no natives of N. A.; no species of this division has hitherto been noticed there. The *Trypetina*, on the contrary, are represented there by numerous, partly very handsome species, all belonging to the genus TRYPETA in Meigen's and Wiedemann's sense.

FAM. XLV. LONCHAEIDAE.

Charact.—Neuration complete; the auxiliary vein runs to the border of the wing in the usual way, under an acute angle and without becoming obsolete, and is very near to the first longitudinal vein; this vein is bare; the two posterior basal cells are small. Front at each side with a single row of bristles; border of the mouth without vibrissæ; clypeus rudimentary. Middle tibiæ with spurs; all tibiæ without erect bristle on the exterior side before the tip. The ovipositor of the female consists of three joints and is rather horny, quite flattened, and ends in a simple point.

They are divided into the PALLOPTERINA having more slender legs and a broader front, and the LONCHÆINA with stouter legs and a more narrow front.

There is only one species in N. A., that I know of, belonging to the genus PALLOPTERA: of the second division I have several species of LONCHÆA, a part of which seem to be identical with European species.

FAM. XLVI. SAPROMYZIDAE.

Charact.—Neuration complete; auxiliary vein of the usual structure, frequently very much approximated to the first longitudinal vein; costa of the wings without bristles or marginal spine; longitudinal veins without peculiar hairs; posterior basal cells small. Front with a single row of bristles on each side; no vibrissæ on the border of the mouth; clypeus rather rudimentary. Only the middle tibiæ have terminal spurs; all tibiæ with a small erect bristle on the exterior side before the end. Ovipositor of the female not horny.

N. A. has numerous species of the genera SAPROMYZA and LAUXANIA, and a few species belonging to PACHYCERINA *Macq.*, a genus detached from *Lauxania*.

FAM. XLVII. PHYCODROMIDAE.

Charact.—Thorax, scutellum and abdomen flat; pleuræ excised above the coxæ. Front bristly; border of the mouth hairy, with no distinct vibrissæ. Legs stout, tibiæ with spurs and each with an erect hair or small bristle on the outside before the tip; the first joint of the posterior tarsi not abbreviated; last joint of all tarsi enlarged, with stout claws and long pulvilli. Neuration of the wings complete; auxiliary vein distinct in its whole length; costa without bristles; basal cells not small.

A certain resemblance with the *Borboridæ* can by no means be overlooked; however, the *Phycodromidæ* are readily distinguished by the completeness of the auxiliary vein, the absence of the vibrissæ so remarkable in those, by the first joint of the posterior tarsi not being abbreviated, and by the increased size of the last joint of all tarsi. They appear to have more true relation to the *Helomyzidæ*, but from these too they are sufficiently distinguished by the costa of the wings having no bristles and the border of the mouth having close hairs, but no real vibrissæ.

Of this family I have seen only one CŒLOPA captured in N. A. It was remarkable by the exceedingly strong spines of its legs.

FAM. XLVIII. HETERONEURIDAE.

Charact.—Neuration of the wings complete, but the first longitudinal vein rather short, and the auxiliary vein very much approximated to it; costa without bristles; basal cells small. Front with long bristles; border of the mouth with a vibrissa at each side; clypeus not developed; palpi broad and proportionately large. Legs, and especially the tarsi, slender; middle and posterior tarsi with spurs; all the tibiæ without erect bristle on the exterior side before the tips; claws and pulvilli very small.

I know five N. A. species of this family, four of which belong to the genus HETERONEURA *Meig.*; the fifth cannot be conveniently placed in any of the genera as yet established.

FAM. XLIX. OPOMYZIDAE.

Charact.—Front with stout bristles above; clypeus rudimentary; border of the mouth either pubescent or with long hairs, the foremost of which sometimes forms a distinct vibrissa. Proboscis short; palpi rather small. Middle tibiæ with a distinct, posterior tibiæ with a very short spur; the exterior side of the tibiæ without erect small bristle before the tip; claws and pulvilli small. Wings elongated and narrow, with no bristles at the costa; the axillary incision and alulæ are either wanting or very diminutive. First longitudinal vein much abbreviated; the auxillary vein becomes obsolete before reaching completely the first longitudinal vein; the latter emits, shortly before its end, towards the costa, a branch, which may be considered as the end of the auxiliary vein; basal cells small.

No species belonging to this family has as yet been noticed in N. A.

FAM. L. SEPSIDAE.

Charact.—Head rounded; front bristly; border of the mouth more or less hairy, the foremost hair often imitating a vibrissa; clypeus rudimentary; proboscis short; palpi exceedingly small or wanting. Abdomen tapering towards the base. Middle tibiæ with distinct spurs; claws and pulvilli small. Neuration of the wings complete; the auxiliary vein distinctly separated from the first longitudinal vein; the two posterior basal cells rather large.

The most essential character of this family is the rudimentary condition of the palpi. With this exception its characters are rather similar to those of the *Micropezidæ*. The genus *Cephalia* approaches very much the *Sepsidæ* in structure, but its incrassated proboscis, its large and broad palpi, and its considerably developed clypeus prevent it from being reunited with them; it must, therefore, remain among the *Ortalidæ*.

The species of *Sepsidæ* occurring in N. A. belong to the genera NEMOPODA and SEPSIS, and are, in part, identical with European species.

FAM. LI. DIOPSIDAE.

Charact.—Neuration of the wings incomplete from the absence of the foremost of the two small basal cells; the auxiliary vein very much approximated to the first longitudinal vein. Head prolonged in two lateral apophyses bearing the eyes; front bristly only on the upper part; border of the mouth with no vibrissæ. Anterior femora incrassated.

One species, or—if the second one, described by Dr. A. Fitch, should really prove different—two species of the genus SPHYRACEPHALA *Say* have hitherto been found in N. A.

FAM. LII. PIOPHILIDAE.

Charact.—The auxiliary vein, on its whole length, is coalescent with the first longitudinal vein; with this exception the neuration of the wings is complete. Front with some small bristles above only; border of the mouth with a vibrissa on each side; clypeus rudimentary; legs rather stout, almost of the structure of those of the *Sciomyzidæ;* middle tibiæ with spurs; all the tibiæ without erect bristle on the exterior side before the tip.

The three N. A. species of PIOPHILA which I have seen are quite identical with European ones; a fourth differs so much from all the known *Piophilæ* in the form of the head and the structure of the antennæ, that it must be considered as the type of a new genus. It seems to be the same species on which Mr. Walker has founded his genus PROCHYLIZA; if that be really so, he would, by assigning it a place immediately by *Chyliza*, have shown that he had been fully mistaken about its true relation.

FAM. LIII. EPHYDRINIDAE.

Charact.—Face convex, with no distinct furrows for the reception of the antennæ and without vibrissæ, though frequently beset with hairs or bristles; clypeus very much developed; opening of the mouth large; proboscis incrassated with a swollen chin. Neuration of the wings incomplete; the auxiliary vein distinct only at its base; the foremost of the two small basal cells reunited with the discal cell. Middle tibiæ with spurs.

They are divided into three sections: *Notiphilina*, *Hydrellina*, and *Ephydrina*. The *Notiphilina* are characterized by the second joint of the antennæ being unguiculate. The *Hydrellina* and *Ephydrina*, in which that joint is not unguiculated, differ from each other by the former having the eyes hairy and the latter bare.

The N. A. species hitherto recorded have been so badly characterized that there is no possibility to decide to which section, and of course far less to which genus they belong. The species which I am acquainted with and have described in the following pages, are distributed among the three above named sections as follows: I. *Notiphilina:* 1. DICHÆTA *Meig.* with two European species; 2. NOTIPHILA *Fall.* five species; 3. PARALIMNA *Loew*, one species; 4. PSILOPA *Fall.* five species; 5. DISCOCERINA *Macq.* five species. II. *Hydrellina:* 6. HYDRELLIA *Desv.* six species; 7. PHILYGRIA *Stenh.* three species. III. *Ephydrina:* 8. OCHTHERA *Latr.* four species, one of which is identical with a European species; 9. BRACHYDEUTERA *Loew*, one species; 10. PARYDRA *Stenh.* two species; 11. EPHYDRA *Fall.* one species; 12. SCATELLA *Desv.* three species, one of which cannot be positively distinguished as yet from a European species.

FAM. LIV. GEOMYZIDAE.

Charact.—Front with stout bristles above; border of the mouth with vibrissæ. Clypeus rudimentary. Middle tibiæ with spurs; all the tibiæ with a small erect hair on the exterior side before the tip. Wings with bristles on the costa; first longitudinal vein exceedingly abbreviated, and the auxiliary vein so approximated to it that it is distinctly separated from it only towards the base; the two posterior basal cells very small.

I know only one species of this family indigenous in N. A. and belonging to the genus DIASTATA. Mr. Walker records an insect which he believes to be likewise a *Diastata*.

FAM. LV. DROSOPHILIDAE.

Charact.—Front with bristles above; face with distinct sub-antennal furrows; at the border of the mouth there is a feeble, frequently rather indistinct small vibrissa. Middle tibiæ with very feeble spurs; on the exterior side of the tibiæ there is either a very small or no erect bristle before the tip. Wings without bristles on the costa; the first longitudinal vein is exceedingly abbreviated; of the auxiliary vein there is only a rudiment; the discal cell is usually, but not in all genera, united with the foremost of the two small basal cells. Claws and pulvilli very small.

Numerous species of Drosophila are found in N. A., some of which are perfectly identical with European species, and one Stegana, the difference of which from the European *Stegana hypoleuca* is at least liable to doubt.

Fam. LVI. OSCINIDAE.

Charact.—Front without bristles, the crown having only a few short ones; border of the mouth without vibrissæ, which, however, are represented sometimes by a small hair on each side. Middle tibiæ with small spurs; all the tibiæ without erect bristle on the exterior side before the tip. Costa of the wings without bristles. The auxiliary vein is completely wanting; the anterior of the two small basal cells is united with the discal cell, the posterior one is totally wanting.

The N. A. species of this family known to me are distributed among the genera Chlorops, Crassiseta, Siphonella, Meromyza, and Oscinis. The species described by Wiedemann under the name of *Homalura plumbella* likewise belongs to the genus *Siphonella*. Macquart has established a genus, Ectecephala, on a N. A. species, and he says it is nearly related to *Platycephala* and *Eurina;* if that is really the case, it must also be recorded here.

Fam. LVII. AGROMYZIDAE.

Charact.—Front with strong bristles; border of the mouth with a vibrissa on each side. Middle tibiæ with a terminal spur; all the tibiæ on the exterior side without erect bristle before the tip. Wings without bristles on the costa; first longitudinal vein very short, and the auxiliary vein connected with it at the tip; basal cells existing, but small; posterior transverse vein generally far distant from the border of the wing.

The N. A. species which I have seen belong to the genera Agromyza, Lobioptera, and Milichia.

Fam. LVIII. PHYTOMYZIDAE.

Charact.—Front bristly; border of the mouth with vibrissæ on each side. Middle tibiæ with spurs; all the tibiæ without erect bristle on the exterior side. Wings without bristles on the costa; first longitudinal vein very short; auxiliary vein connected with it at the tip; basal cells existing, but small; posterior transverse vein wanting.

The genus Phytomyza is represented in N. A.

Fam. LIX. ASTEIDAE.

Charact.—Front bristly above; border of the mouth with a vibrissa at each side. Middle tibiæ with spurs; all the tibiæ without erect bristle on the exterior side. Wings without bristles on the costa; first longitudinal vein exceedingly short; auxiliary vein connected with it only at the tip; second longitudinal vein very short; two posterior basal cells as well as the posterior transverse vein wanting.

No N. A. species of this small family is as yet known.

Fam. LX. BORBORIDAE.

Charact.—Thorax, scutellum, and abdomen flat; front bristly; face excavated, with a vibrissa on each side of the border of the mouth; clypeus developed; first joint of the posterior tarsi abbreviated. Neuration of the wing incomplete, only a commencement of the auxiliary vein being at best visible; the hindmost two basal cells are not complete in all genera.

N. A. seems to possess numerous species of the genus Borborus, which have not yet been carefully compared with the European species. One species taken in Cuba is identical with an African one.

Fam. LXI. PHORIDAE.

Charact.—Antennæ apparently single jointed, with a long bristle. Wings with several stout veins running into the costa, and three or four weak ones, which run across the surface of the wings and are not completely connected with the hindmost of the stout veins, from which they appear to issue. Femora flattened.

Many species of Phora seem to occur in N. A.; their form, as far as I am acquainted with them, differs in no way from that of the European ones.

III. CORIACEA.

FAM. LXII. HIPPOBOSCIDAE.

Charact.—**Head flattened; first joint of all the tarsi, or at least of the anterior and middle tarsi, abbreviated.**

N. A. possesses species of the genera HIPPOBOSCA *Linn.*, MELOPHAGUS *Latr.*, ORNITHOMYIA *Leach*, and OLFERSIA *Wied.*, several of which are perfectly identical with European species.

FAM. LXIII. NYCTERIBIDAE.

Charact.—**Head not flattened; first joint of all the tarsi rather long or very long, in comparison with the following.**

One STREBLA only and a species belonging to a new genus are known to me as occurring in N. A.

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II.

ON THE NORTH AMERICAN TRYPETIDAE.

1. *Extent of the family* TRYPETIDÆ.

In stating that the family of *Trypetidæ* comprises the genera *Trypeta* Meig. and *Dacus* Wied. we define its limits as exactly as is possible before having developed its character.

The genus *Trypeta* was founded by Meigen in *Illiger's Magazine* II, 277, 94. Shortly after, the same genus was published in *Schrank's Fauna Boica* under the name of *Trupanea*, and still later, it appeared in Latreille's writings, in a more vague circumscription, under that of *Tephritis.*

The number of species belonging to it has so much increased since the time of its creation, and so considerable differences in their organization have been observed, that not only the limits of the genus have become a little uncertain, but also the necessity of a division into smaller genera was felt, and more than one attempt to satisfy this want has been made.

The first attempt, abortive both from the choice of unfit characters and from the vagueness of the observations used as foundation for the characters, was made by Robineau Desvoidy, who distributed the species known to him among the genera *Ensina*, *Stylia*, *Oxyna*, *Oxyphora*, *Terellia*, *Forellia*, *Xyphosia*, *Sitaria*, *Orellia*, *Tephritis*, *Urophora*, *Aciura*, *Prionella*, *Sphenella*, *Urellia*, *Acinia*, and *Nœeta*, to which his genera *Acidia* and *Strauzia* must be also added.

Subsequently Macquart reunited these genera into five: *Urophora*, *Terellia*, *Tephritis*, *Acinia*, and *Ensina*, to which he added the genus *Ceratitis* M'Leay, which he had previously described himself under the name of *Petalophora*. Later, in the "*Diptères exotiques*," he added *Acanthoneura*, *Campylocera*, *Meracantha*, *Toxura*, and *Epicerella;* the four last, however, if we may depend on his descriptions and figures, must be placed among the *Ortalidæ*.

Mr. Walker, in the "List of the Diptera of the British Museum," adopted the genera of R. Desvoidy, after modifying the characters of several of them, and retained the genera *Anomoia* and *Euleia*, which he had previously founded himself; besides, he erroneously brought again among the *Trypetidæ* the genus *Camptoneura*, which Macquart had formed on *Trypeta picta* Wied., and correctly placed among the *Ortalidæ*.

The most recent attempt at a detailed classification of the European species of the old genus *Trypeta* is that given by Rondani in his "*Prodromus Dipterologiæ italicæ.*" He retains—though in a much altered sense—the genera of R. Desvoidy: *Oxyna*, *Urophora*, *Rivellia*, *Tephritis*, *Acinia*, *Aciura*, *Terellia*, and *Orellia*, and adopting the genus *Ceratitis* M. Leay and *Myopites* Breb., he creates the following new genera: *Goniglossum*, *Carpomyia*, *Cerajocera*, *Chetostoma*, *Epidesmia*, *Myoleja*, *Spathulina*, *Dithryca*, and *Oplocheta*. But these genera are less fit for reuniting what is really allied, than for isolating out of their nearest relationship such species as are distinguished by any specific peculiarity and for crowding them inordinately together. The dichotomic division of genera from single characters without any indication of the true generic distinctions, renders it impossible to refer to them the other species described by authors, and it is not at all sufficient for this purpose to name a typical species, especially as some of these typical species have not yet been described, and the correctness of the names of the others is not proved. Moreover, the characters ascribed by Rondani to the single genera are not all quite certain, and some of them, for instance the scutellum of *Myoleja*, which is said to have two bristles, the scutellum of *Ceratitis* six bristles, appear to be errors of the observer.

If we add to what we have said already that the genera *Xarnuta*, *Themara*, *Calantra*, and *Aragara*, erected by Walker in the "Proceedings of the Linnæan Society," with some probability belong here, and that perhaps the genus *Dasyneura* Saund., and *Rachiptera* and *Elaphromyia* Bigot are *Trypetidæ*, both the variety of the forms belonging to the genus *Trypeta* Meig. and a picture of the chaotic state into which their arrangement has been thrown will be sufficiently illustrated.

The genus *Dacus*, restricted by Meigen to the *Dacus Oleæ* Fabr. (the renowned blight of the olive) and used by Wiedemann in a wider sense, is nearest related to the genus *Trypeta* Meig.; Fabricius, who formed this genus, comprises so different species in it that we may scarcely consider it as a creation of his. However striking the difference may be between the greatest part of the species of *Trypeta* and the larger naked species of *Dacus*, yet some of the latter approach very much to the larger species of the polymorphous genus *Trypeta*, and show the near relation of both genera. Wiedemann, misled by some *Trypetæ*, had become uncertain about the limits between the genera *Dacus* and *Trypeta*, or he would not have placed the large Brazilian *Trypeta parallela* among *Dacus*. One of the surest marks for separating both genera is furnished by the structure of the female abdomen, which in *Trypeta* shows five, in *Dacus* four segments before the borer, the fifth being very short and concealed under the fourth. None of the other characters, however marked they may appear, is so constant as this. Macquart has already justly observed that the whole of the first group of *Dacus* Wied. is not only a stranger to this genus, but cannot even remain in the same family with it; therefore giving it the generic name of *Senopterina* (which must be mended into *Stenopterina*), he assigned it its right place in the *Ortalidæ*, as will be detailed in the sequel. Among the new genera introduced by Macquart, *Leptoxys* and *Enicocera*, perhaps also *Cardiacera*, may be very nearly related to the genus *Dacus*, which cannot be, however, asserted positively, on account of the insufficiency of Macquart's statements and the incorrectness of his figures. The genus *Bactrocera*, founded by Guérin, seems also to belong here. The same, perhaps, may be said of the genera *Rioxa* and *Strumeta*, formed by Walker in the "Proceedings of the Linnean Society," while the genus *Dasyneura* of Saunders, which Walker in the "List of the Diptera of the British Museum" places near *Dacus*, seems to stand much nearer to *Trypeta*.

The species of the genus *Trypeta* and those smaller genera which either have been comprised in *Trypeta* or founded in its neighborhood, together with the species really belonging to *Dacus* and the smaller genera subordinate to or co-ordinate with it in a similar way, form the family *Trypetidæ*, one of the group of closely related families of the *Acalypteræ* which are characterized by their corneous ovipositor.

2. *Division of the family into* TRYPETINA *and* DACINA.

A division in two groups may be established as above indicated. The two groups would be: *Trypetina*, with five distinct segments of the female abdomen, and *Dacina*, with apparently four segments. The latter, moreover, have some peculiarities in the structure and neuration of their wings, which, however, allow of no very sharp limitation. Most frequently a dilatation of the second basal cell and of the space between the third and fourth longitudinal veins (in consequence of which the second longitudinal vein is pushed towards the costal margin) and the posterior angle of the anal cell extended in a long point, are the most striking peculiarities in the structure of the wings. But a sharp limitation of the two groups is perhaps not to be urged too much, as transitions from the one to the other are certainly not wanting, and another division quite as useful seems to be possible. In the mean time the groups *Trypetina* and *Dacina*, as we have defined them, are characterized as well as our purpose requires. We have now to fix the relation of the family *Trypetidæ* to the nearest families, particularly to that of *Ortalidæ*, since almost all authors have mixed the species of these two families. For this purpose we want only to find out the natural character of the family, which cannot be obtained but from a close examination of the greatest possible number of species and from a careful appreciation of the systematic value to be assigned to the observed peculiarities and differences.

3. *Natural character.*

After examining nearly 300 species from different parts of the world, I believe I may speak as follows about the organization of the *Trypetidæ*.

The bare eyes, in both sexes, are separated by the front, which is of equal breadth or only a little narrowed anteriorly. The middle of the front is not sharply separated from the lateral lists, but has often a different color. The front is even, usually with an almost microscopic, rarely with a longer pubescence, sometimes it is totally bare. On its vertical border it always bears two very strong bristles, rather distant from each other. Two short callosities, usually little perceptible, run from them, converging but faintly anteriorly, and bearing one or two bristles directed upwards. On the vertical border itself there are two bristles, each near the upper angle of the eye, and in the middle behind the ocelli there is another pair of bristles, sometimes very stunted. This is also the case with a pair of bristles directed anteriorly, and inserted between the ocelli. More anteriorly on the front there are, at each side of the orbit, two or three stouter bristles, but generally less stout in the *Dacina* than in the *Trypetina*, whereas in the males of some *Trypetina* they are thickened into spines, or even inserted upon lateral processes. The little crescent cut off by the frontal fissure is often very distinct, though never very large. The antennæ are directed downwards, the third joint elongated or long; the bristle nearly bare, or with a very short pubescence; only in a few species it has longer hairs, but is never pectinated. The face shows below each antenna a flat excavation, more deepened in those few species which have a keel in the middle of the face; the anterior border of these excavations forms a more or less distinct elevation, and sometimes almost a keel. The cheeks are more or less hairy; in a few *Trypetina* the furthermost hairs almost have the appearance of vibrissæ, which, however, are never present. All more naked species have also less hairy cheeks. The proboscis is never much thickened; the suctorial flaps are sometimes very short and rather broad, sometimes rather long, sometimes of an extraordinary length, as for instance in the species of *Myopites* Breb., where they seem to become much stouter, which was the reason why a species of *Myopites* was placed by Fabricius in *Stomoxys*. The prolongation of the suctorial flaps is proportionate to that of the stem; not unfrequently in most nearly related species the structure of the proboscis seems to be very different; but on a closer examination this difference appears not to be essential, and cannot even always be used in characterizing the small genera into which the genus *Trypeta* Meig. has been divided. Among the *Dacina* I have never seen a species with a very prolonged proboscis. The oral cavity is large, sometimes very large and widened, and not seldom a little prolonged at its anterior border; its form depends very much on that of the proboscis; for in those species which have a very long proboscis, the anterior border of the mouth is usually also much more projecting. The palpi are either more applied to or more laid upon the labium, when it is retracted into the mouth-hole; their form is more or less spatulate, and generally more elongated in those species which have a long proboscis than in those with a short one. The clypeus owing its origin to a duplication of the skin which connects the stem of the labium with the border of the mouth is narrow, and being concealed within the mouth-hole can only be seen anteriorly in those species in which the anterior part of the peristoma is more drawn upwards.

There is no striking peculiarity in the structure of the thorax. The transverse suture, in agreement with nearly all the Acalyptera, is distinct in the neighborhood of the lateral border, and totally obsolete in the middle of the thorax. The bristles of the thorax not only offer good specific characters, but sometimes also prove very fit for the separation of genera. In that respect the bristles of the middle of the upper side of the thorax deserve attention; in those species in which their number is the most complete there are three pairs, one before the suture, the second behind the suture, the third a little before the scutellum. More frequently only the second and third pair of these bristles are present, sometimes only the third; in almost all African species of *Dacus* they are all wanting. Besides these bristles of the middle of the thorax there are two rows of bristles on each side; the exterior row consists of four bristles, the first of which stands on the humeral callosity, and is often wanting in the *Dacina;* the second has its place before the transverse suture; the third, which is often much weaker than the others, in the lateral dilatation of the transverse suture; the fourth above and a little behind the base of the wing. The interior row consists of three bristles only, corresponding to the three last bristles of the exterior row, but is placed a little more backwards than these. The scutellum, which is more or less convex, generally bears four stout bristles, but in many *Dacina* and some *Trypetina* only two; there is sometimes on each side a weaker bristle between the stout ones.

The abdomen of the male shows only four distinct segments, the last of which is more or less elongated. The abdomen of the female has five segments before the borer, and the last of them in the *Trypetina* is always distinct, whereas in the *Dacina* it is very small, and so concealed under the fourth segment that the abdomen of the female seems to consist only of four segments. That segment which is usually numbered the first, and will also be numbered so in the following descriptions, seems to be composed of two segments soldered together. In many *Dacina* we also see the next segments more or less completely coalescent on their upper side. The borer of the female is always of a corneous substance; it is formed of three segments, which are retractile like the drawers of a telescope, and often very long; the last ends in a simple more or less sharp point; the first segment is either more conical, or more cylindrical, and then usually thick at its base, or it is quite flat; in most species it is hairy, in others it is beset with hairs at the tip only; in others again is quite bare; its length varies exceedingly in the various species; the second and the third segments of the borer are always bare. To the length of the borer of the female corresponds that of the thread-like penis of the male. The hairs of the body are sometimes fine and short, sometimes coarse and long; in the latter case the posterior margin of the abdominal segments is generally beset with bristles, which in the species having fine and short hairs, are either totally wanting or are present only at the posterior borders of some segments, most frequently on that of the last.

The legs are always of moderate length, and of a rather robust structure; they are beset everywhere with short hairs, which become longer on the upper side of the posterior tibiæ of some species. There are usually some longer bristles on the under side of the anterior femora, and frequently also on their upper side; similar bristles exist on the posterior femora of several species, and sometimes even on the middle femora. The tips of the middle tibiæ are always spurred; otherwise, the tibiæ have no bristles. It is very characteristic for all the *Trypetidæ* that the erect bristles are totally wanting, which some allied families, for instance the *Sapromyzidæ*, possess on the outside of the tibiæ, not far from the tip. The first joint of the tarsi is always prolonged. The claws and pulvilly are small, and of equal form in both sexes.

The neuration of the wings is that of *Acalyptera* in its highest perfection, and shows many characters peculiar to this family. The auxiliary vein is separated from the first longitudinal vein, though often approximated to it, especially in some *Dacina;* it never runs in the usual way, that is, at an acute angle and with equal distinctness as far as its end or even incrassating towards the border of the wing, but turns suddenly towards it, and, at the same time, becomes much more indistinct, the more so as the space between its end and that of the first longitudinal vein is incrassated. At the place where it runs into the border of the wing, the latter bears a small marginal spine, quite indistinct in many species, and which cannot, therefore, be considered as one of the characters of the *Trypetidæ*. Generally the whole length of the first longitudinal vein is beset with bristles; this is also most frequently the case with the base, or a greater part, or even the whole length of the third longitudinal vein; much more seldom there are bristles on the fifth longitudinal vein. The two small basal cells are proportionately large; the posterior of them, *i. e.*, the anal cell in most, but not all species, has its posterior angle drawn out into a point. The thickening of the costal vein always reaches to the fourth longitudinal vein. The surface of the wing has in all species a microscopic pubescence.

From the above enumerated structural peculiarities we may derive the following characters for the family of *Trypetidæ*:—

1. The borer of the female is corneous, three-jointed, and ends in a simple point; the penis of the male answers the borer in length, and is thread-like and not divided at its end.
2. The front is broad in both sexes, and there are stout bristles on the anterior part of its lateral border, not belonging to the row which descends from the vertex, but forming a separate row which is placed nearer to the lateral border of the front.
3. There are spurs at the end of the middle tibiæ, and no bristles whatever on all tibiæ, except, in a few species, bristle-like hairs on the upper side of the posterior tibiæ.
4. The neuration is the completest among the *Acalyptera*; the auxiliary vein takes a steep turn towards the border of the wing, and becomes indistinct towards its end.

4. *On the relations of this family.*

The family most nearly related to the *Trypetidæ* is that of the *Ortalidæ*. The two principal characters, by which the former are distinguished from the latter, are the stout bristles existing on the anterior part of the lateral border of the front, and the steep direction in which the tapering end of the auxiliary vein runs to the border of the wing. Both these characters are very constant; should it happen that one of them is less sharply expressed, the other will be the more striking, and so an absolute certainty is afforded about the limits of these two families, the species of which have hitherto been so much mixed together.

The *Pallopteridæ* and *Lonchæidæ* are not quite so nearly related to the *Trypetidæ* as the *Ortalidæ*. They also want the bristles on the anterior part of the lateral border of the front, and the end of the auxiliary vein never shows the peculiarity which characterizes the *Trypetidæ.* Moreover, their basal cells are smaller, and the first longitudinal vein never has any bristles, but only a short pubescence like that of the remainder of the surface of the wing.

The *Lauxanidæ* and *Sapromyzidæ* have still less relation to the *Trypetidæ*. They are readily distinguished from the *Trypetidæ* by their middle and hind tibiæ being spurred with bristles before their tip, and the outside of the tibiæ bearing an erect bristle before the tip; the first longitudinal vein of the wings has no bristles, and the end of the auxiliary vein never has the character peculiar to that of the *Trypetidæ;* the two posterior basal cells are small; the bristles on the anterior part of the lateral border of the front are wanting; in this respect we must not be deceived by the rows of bristles, which run from the two bristles of the vertical border, and which, being more scattered, extend farther anteriorly; there always exists only a single row of bristles, whereas the frontal bristles in the *Trypetidæ* always form two rows on each side, one of which may be called the superior and interior, the other the inferior and exterior.

With the exception of the families mentioned above there is no other so nearly allied to the *Trypetidæ*, that it would be necessary to point out its differences.

5. *On the N. A. species hitherto recorded.*

What has been written about the N. A. *Trypetidæ* is very little in amount. No species at all of the section *Dacina* has been described. I have, however, seen the fragments of a fly captured in Cuba, which belongs either to *Dacus* or to one of the nearest genera of the *Ortalidæ;* but as it is one of those osculating forms between the two allied families, nothing can be said with certainty about its systematic place before having seen a better preserved specimen.

The N. A. *Trypetæ* hitherto recorded are as follows:—

1. **acidusa** *Walk.*, unknown to me, is either a relation of *Tryp. suspensa* and *unicolor*, the descriptions of which will be given hereafter, or belongs to those species similar to them which have the fifth longitudinal vein also beset with bristles.
2. **albiscutellata** *Harr.* must be omitted, since it is undescribed.
3. **antillarum** *Macq.* belongs to the *Ortalidæ*, being erroneously placed by Macquart in *Urophora*, a genus of the *Trypetina.*
4. **arcuata** *Walk.* differs in nothing from *Tryp. flexa* Wied. and belongs to the *Ortalidæ.*

5. **armata** *R. Desv.*, published by the author as *Strauzia armata*, is *Tryp. longipennis* Wied. ♀.
6. **asteris** *Harr.;* the description being unfortunately inaccessible to me, I can say nothing about it. The name is preoccupied by Mr. Haliday.
7. **avala** *Walk.*, quite unknown to me; Mr. Walker's statements are not sufficient to decide whether it belongs to the *Ortalidæ* or not.
8. **beauvoisii** *R. Desv.;* the description is too bad to allow its true position to be determined; but it is certainly not among the species known to me.
9. **caliptera** *Say* is *Tryp. sparsa* Wied.; the older name deserves the preference, the more so as that of Say is not correct.
10. **cinctipes** *Harr.* is an undescribed species, and must be therefore omitted.
11. **comma** *Wied.* a good species and readily recognizable; not possessing it, I cannot give a more detailed description; but having seen it in some collections, I subjoin a fugitive sketch of the reticulation of the wing (Tab. II, fig. 28), trusting that by this figure and Wiedemann's description the species will be recognized. It is not quite certain whether Macquart's *Acinia comma* is the same, since he says that the posterior border of the wings has a large clear spot, which was not the case with the individuals of the genuine *Tryp. comma* Wied. which I have seen. The clear drops near the end of the sixth longitudinal vein being very much crowded, their eventual coalescing into a larger clear spot does not seem impossible.
12. **cornigera** *Walk.* is identical with *Tryp. longipennis* Wied.
13. **cornifera** *Walk.* is a slight variety of *Tryp. longipennis* Wied., in which the bands of the posterior border of the wings are obsolete, which is not seldom the case.
14. **culta** *Wied.* (not *cutta*, a misprint corrected by Wiedemann himself). It is a relation of the European *Tryp. reticulata* Schrank, and Wiedemann's description is sufficient for recognizing this species. On Tab. II, fig. 29, I subjoin a sketch of the reticulation of the wings, which I made several years ago; though the circumference of the wing may not be quite correct, yet the species will, I hope, be recognized from it.
15. **dinia** *Walk.* seems to be a *Trypeta* related to the European *Tryp. rotundiventris* Fall., *tibialis* R. Desv., etc. It may stand nearest to *Tryp. insecta*, the description of which follows hereafter.
16. **electa** *Say* will be exactly described in the sequel.
17. **fimbriata** *Macq.* is *Tryp. culta* Wied.
18. **flavonotata** *Macq.* is *Tryp. electa* Say.
19. **flexa** *Wied.* is by no means a *Trypeta*, but an *Ortalis* not rare in collections.
20. **fucata** *Fabr.* seems to be a true *Trypeta*, but will be rather hard to recognize, unless an original specimen can be compared.

21. **fulvifrons** *Macq.* I hardly conceive how Macquart could locate among *Urophora* a species which is an *Ortalis*, and nothing else but *Ortalis ænea* Wied.

22. **inermis** *R. Desv.*, published by the author as *Strauzia inermis*, is *Tryp. longipennis* Wied. ♀.

23. **interrupta** *Macq.* seems to be an *Ortalis* related to *Herina rufitarsis* Macq., if it is not a mere variety of this species, so variable in the color of its body; moreover, it is so vaguely described that it is not possible to say anything with certainty about it.

24. **latipennia** *Macq.*, described by Macquart under the name of *Platystoma latipennis;* it is, however, certainly a *Trypeta*, and I hope not to be mistaken in identifying it with *Tryp. sparsa* Wied.; the representation of the head is certainly nothing but the invention of the draughtsman, or a foreign head had been glued to the specimen.

25. **lichtensteinii** *Wied.* I have seen this beautiful species about sixteen years ago, and made a sketch of the picture of the wing, which I give in Tab. II, fig. 25. The bristle of the antenna is thickened at its base in a rather striking manner.

26. **longipennia** *Wied.* will be more accurately described in the sequel. The name of it is ascertained from the inspection of the originals. It is surprising that Wiedemann does not mention the thickening of the frontal bristles of the male, though the males in his collection show it. Perhaps he had specimens enough to satisfy himself that this peculiarity is not constant.

27. **marginepunctata** *Macq.* is unknown to me.

28. **melliginis** *Fitch* belongs to the *Ortalidæ*, and is *Herina rufitarsis* Macq.

29. **mevarna** *Walk.*, a *Trypeta* which has the apex of the wings only reticulated, and is allied probably to the European *Tryp. stellata* Füssl. Among the below described species *Trypeta solaris* may have the greatest resemblance to it.

30. **mexicana** *Wied.* seems to be a *Trypeta;* the original perhaps exists in the Berlin Museum. It is none of the species known to me.

31. **narytia** *Walk.* I believe it also to be a *Trypeta;* it is likewise not among my species.

32. **novæboracensis** *Fitch* is the same species as *Tryp. sparsa* Wied. and *caliptera* Say.

33. **nigriventris** *Macq.* probably a *Trypeta* of the group of *Tryp. rotundiventris* Fall.

34. **obliqua** *Macq.*, a *Trypeta*, which seems to be nearly allied to *Tryp. suspensa* from Cuba and *Tryp. unicolor* from New Granada, but differs from both by its small transverse vein having an inclined position, and the first hyaline band running uninterruptedly from the border of the wing to the anterior of the two small basal cells, whereas in those species it is interrupted not far from the costal border.

35. **obliqua** *Say* seems to be related to the European *Tryp. Arctii* Deg. and the below described *Tryp. palposa* from North Wisconsin; the latter has on its abdomen four rows of black spots, whereas *Tryp. obliqua* Say has only two.
36. **ocreala** *Walk.* apparently related to *Tryp. unicolor* from New Granada, but it cannot be identified with this or any other species known to me. The description given by Walker is very vague.
37. **picta** *Fabr.* a *Camptoneura* and consequently an *Ortalideous* species.
38. **quadrifasciata** *Macq.* I believe it to be a *Trypeta* which I do not possess.
39. **quadrifasciata** *Walk.* belongs to the *Ortalidæ* and is *Herina rufitarsis* Macq.
40. **quadrivittata** *Macq.* belongs to the *Ortalidæ*.
41. **scutellaris** *Wied.* I have seen the typical individuals of this beautiful species in the Berlin Museum sixteen years ago. If I recollect right, there were bright bands of a more black than brown color on the two last segments only of the abdomen in the male, but on all segments in the female. I was surprised to see in the female the markings of the wings (Tab. II, fig. 27) more extended than in the male (Tab. II, fig. 26).
42. **scutellata** *Wied.* a *Trypeta* quite unknown to me.
43. **septenaria** *Harr.* must be omitted as being undescribed.
44. **solidaginis** *Fitch* has been amply described in the sequel.
45. **sparsa** *Wied.* I give a detailed description of it.
46. **tabellaria** *Fitch*, not among the *Trypetæ* known to me, nor does it seem to belong to them, but is probably an *Ortalida*.
47. **tribulis** *Harr.* not described and therefore to be omitted.
48. **trimaculata** *Macq.* is the same variety of *Tryp. longipennis* Wied. which Walker has described under the name of *Tryp. cornifera*.
49. **trifasciata** *Harr.* must be omitted as being undescribed.
50. **villosa** *R. Desv.* may be a *Trypeta*, but is so badly described that there is scarcely a possibility to recognize it.

The result of the remarks given about the enumerated 50 species will consequently be as follows:—

1. Five species must be omitted, because they have never been described: *albiscutellata* Harr., *cinctipes* Harr., *septenaria* Harr, *tribulis* Harr., and *trifasciata* Harr.
2. Fourteen species must be blotted out as identical with species previously described: *arcuata* Walk., *armata* R. Desv., *caliptera* Say, *cornigera* Walk., *cornifera* Walk., *fimbriata* Macq., *flavonotata* Macq., *inermis* R. Desv., *latipennis* Macq., *marginepunctata* Macq., *melliginis* Fitch, *novæboracensis* Fitch, *quadrifasciata* Walk., and *trimaculata* Macq.

3. Of the remaining thirty-one species seven, the five first with all certainty, the two last with great probability, must be placed among the *Ortalidæ*. These are: *antillarum* Macq., *flexa* Wied., *fulvifrons* Macq., *picta* Fabr., *quadrivittata* Macq., *interrupta* Macq., *tabellaria* Fitch.
4. Consequently twenty-four N. A. *Trypetæ* have been described, namely: *acidusa* Walk., *asteris* Harr., *avala* Walk., *beauvoisii* R. Desv., *comma* Wied., *culta* Wied., *dinia* Walk., *electa* Say, *fucata* Fabr., *lichtensteinii* Wied., *longipennis* Wied., *mevarna* Walk., *mexicana* Wied., *Narytia* Walk., *nigriventris* Macq., *obliqua* Macq., *obliqua* Say, *ocresia* Walk., *quadrifasciata* Macq., *scutellaris* Wied., *scutellata* Wied., *solidaginis* Fitch, *sparsa* Wied., and *villosa* R. Desv.
5. Of these twenty-four species I possess four only [now five.—O. S.], which I shall fully describe hereafter; they are: *electa* Say, *longipennis* Wied., *solidaginis* Fitch, *sparsa* Wied. [and *obliqua* Say.—O. S.]. Moreover I have seen in other collections four species; they are: *comma* Wied., *culta* Wied., *lichtensteinii* Wied., and *scutellaris* Wied. As an addition to my paper I subjoin the descriptions which Wiedemann has given of them, and accompany them with drawings of the wings, which, however, on account of their being only fugitive sketches, have not the same claim to correctness as the figures of the wings of the other species.

6. *On the systematic arrangement of the species to be described.*

Besides the above mentioned four species I have to describe nineteen new ones, which I leave all united in the genus *Trypeta*. Though they differ in their organization, I think my course is both reasonable and proper. It has been already sufficiently shown, how very uncertain the limits of the family *Trypetidæ* are. For the immediate purpose, it will be quite sufficient if insects of other families are no longer mixed with these. The number of accurately known species must increase considerably, before a convenient classification can be thought of.

The smaller genera hitherto founded on the various forms of the *Trypetina* are partly formed on European species, partly established in a very superficial manner on single species of other parts of the globe. Among the former there are some, which are available or may be rendered available by removing the aberrant species from them; the remaining genera either have no claim to the names of genera, or are understood by different authors in so different a sense as to render their adoption more perplexing than useful. But a few of the available genera are represented in North America. The genera created for single species have usually been established on account of a single striking character, no information being given about the other characters; so it will be next to impossible to place new species in such genera without incurring the risk of gross mistakes.

Such being the case, I will be justified, I think, in comprising all species under the head of *Trypeta*, in the sense of Meigen and Wiedemann. I should be glad indeed if by the communication of numerous species I was enabled to divide the N. A. *Trypetina* into smaller genera. To obtain numerous species is only possible by breeding them, which is a very easy task; for the larvæ are easily discovered; they live in stalk-galls, or in berries and berry-like fruits; but most frequently in the flower-heads of *Compositæ*, among which they prefer the *Cynarocephalæ* to all others.

To prevent any misunderstanding I finally have to observe, that in the following descriptions, by the length of the borer I always meant the length of its first joint only, which is also comprised in the indication of the length of the females. The length of the whole borer depends so much on the more or less extension of its three segments, that no certain measure of it can be given.

*Synopsis of the species described in the sequel.**

1	Wings pictured (reticulate or banded).	2
	Wings not pictured, hyaline.	26
2	Wings banded.	3
	Wings reticulate.	15
3	Third longitudinal vein with bristles.	4
	Third longitudinal vein without bristles.	10
4	Abdomen black.	1 **discolor, n. sp.**
	Abdomen yellow.	5

* If a species is not found among those enumerated in this synopsis, before pronouncing it to be new the Appendices I and II should be consulted. This table contains only species described from specimens, and not merely quoted from other works. O. S.

5	Face very receding.	**2 longipennis** *Wied.*
	Face not receding.	6
6	Back of the thorax not striped.	7
	Back of the thorax striped.	9
7	Abdomen with black dots.	**obliqua** *Say.**
	Abdomen without black dots.	8
8	The band rising over the posterior transverse vein is connected with the preceding on the posterior border.	**3 fratria**, n. sp.
	The band rising over the posterior transverse vein is not connected with the preceding.	**4 suspensa**, n. sp.
9	The two middle bands of the wing diverge towards the posterior border.	**5 unicolor**, n. sp.
	The two middle bands of the wing are converging towards the posterior border.	**6 electa** *Say.*
10	Thorax and abdomen differing in color.	**7 insecta**, n. sp.
	Thorax and abdomen of the same color.	11
11	Color of the body yellow.	12
	Color of the body black.	14
12	Abdomen with black dots.	**8 palposa**, n. sp.
	Abdomen without black dots.	13
13	Basal third of the wing hyaline.	**vernoniæ**, n. sp.†
	Basal third of the wing pictured.	**9 suavis**, n. sp.
14	Scutellum yellow.	**10 cingulata**, n. sp.
	Scutellum black.	**11 polita**, n. sp.
15	Wings much widened.	16
	Wings not widened.	17
16	Tip of the wings with an uninterrupted white seam.	**12 sparsa** *Wied.*
	Tip of the wings with an interrupted white seam.	**13 rotundipennis**, n. sp.
17	Proboscis geniculated.	18
	Proboscis not geniculated.	19
18	Stigma with a limpid drop.	**14 clathrata**, n. sp.
	Stigma without limpid drop.	**15 humilis**, n. sp.
19	Reticulation of the wing not radiating at its tip.	20
	Reticulation of the wing radiating at its tip.	21
20	Front exceedingly broad.	**16 solidaginis** *Fitch.*
	Front of moderate breadth.	**17 seriata**, n. sp.
21	Wings reticulate only on the apical half.	**18 solaris**, n. sp.
	Wings reticulate on their whole surface.	22
22	The whole reticulation equally broken.	**19 æqualis**, n. sp.
	The reticulation broken much less in the middle.	23
23	Abdomen yellow.	24
	Abdomen black.	25

* See Appendix III. † Ibid.

24	Reticulation paler in the middle.	20 **festiva**, n. sp.
	Reticulation everywhere of the same color.	21 **bella**, n. sp.
25	The curvature inside of the first posterior cell considerable.	22 **latifrons**, n. sp.
	The curvature inside of the first posterior cell very small.	23 **melanogastra**, n. sp.
26	Stigma fuscous.	**albidipennis**, n. sp.*
	Stigma pale.	**alba**, n. sp.†

7. *Description of the species.*

1. T. discolor Loew. ♂. (Tab. II, fig. 1.)—Lutea, abdomine nigro, alarum fasciis quatuor obliquis fuscanis, primâ et secundâ antice, tertiâ et quartâ postice connexis, venâ longitudinali tertiâ setosâ, venulis transversis valde approximatis.

Luteous yellow with the abdomen black; wings with four very oblique brownish bands, the two first being anteriorly, two last posteriorly connected; third longitudinal vein with bristles and the two transverse veins approximate. Long. corp. 0.13. Long. al. 0.15.

Yellow with a rather glossy black abdomen, which color becomes more blackish-brown near the base. Front proportionately rather narrow; three bristles at each side are of a browner color and directed anteriorly. Antennæ yellowish, not reaching as far as the border of the mouth; bristle of the antennæ thin, apparently naked. Face descending rather straight downwards, but little excavated. Opening of the mouth proportionately large. Proboscis short, palpi somewhat prominent. Upper side of the thorax with short yellow hairs and yellowish-brown bristles; it has no pale stripes, but there is an obsolete, paler, longitudinal stripe between it and the pleuræ. Pleuræ of the color of the upper side of the thorax, with yellowish bristles; the neighborhood of the coxæ is blackish. Scutellum with four bristles. Abdomen with short black hairs. Legs yellow, anterior femora with ochraceous bristles on the under side. Wings glassy with four very oblique brown bands, which are partly tinged with brownish-yellow on the inside. The first band begins at the base of the wing, where it is connected with the second, runs over the anal cell as far as the base of the third posterior cell, and, including the fourth longitudinal vein, projects a little, whereupon leaving the latter, it bends towards the posterior border of the wing, which it reaches in the middle between the tips of the fourth and fifth longitudinal veins; its color is yellowish-brown near the base of the wings and dark brown beyond the basal cell. The second band runs first from the base of the wing to near the tip of the first longitudinal vein, then crosses the wing obliquely, on the border of which it includes the tip of the fifth longitudinal vein; the two transverse veins are included by it in such a way that their anterior ends are placed exactly on the outside border of the band; the color of this band is brownish-yellow with darker brown edges which gradually overcome the lighter color at the posterior end; also that portion of it which covers the stigma and the space immediately beneath it, is dark brown. The third band begins on the costal border immediately behind the stigma and reaches the posterior border immediately behind the tip of the fourth longitudinal vein; it is brownish-yellow, edged with dark brown, the posterior end being likewise dark brown. The fourth band begins a little before the tip of the second longitudinal vein and runs on the border of the wing as far as the fourth longitudinal vein, where it is connected with the third band; its color is dark brown, being brownish-yellow only at its anterior end. The two transverse veins are very near each other and very steep; none of the longitudinal veins is extraordinarily arcuated; the second, third, and fourth longitudinal veins diverge a little at their tips; the bristles of the third longitudinal vein are very distinct and reach as far as its tip.

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* See Appendix III.

† Ibid.

Hab. Cuba. (Riehl.)

2. T. longipennis Wied. ♂ & ♀. (Tab. II, fig. 2 ♂, 3 ♀.)—Flava, angusta, rivulis fasciisque alarum angustarum flavo-fuscanis, facie valde recedente.

Yellow, slender; the narrow wings with brownish-yellow rivulets and bands; the face much receding. Long. corp. 0.17—0.26. Long. al. 0.22—0.30.

Syn. *Trypeta longipennis* Wiedemann, Auss. Zweifl. II, 483, 12.
Strauzia armata R. Desvoidy, Myod. 719, 2. (♂.)
Strauzia inermis R. Desvoidy, Myod. 718, 1. (♀.)
Tephritis trimaculata Macquart, Dipt. exot. II, 226, 8. Tab. XXXI, fig. 3.
Trypeta cornigera Walker, List. Brit. Mus. IV, 1010.
Trypeta cornifera Walker, List. Brit. Mus. IV, 1011.

Very variable both in size and in the color of its body and wings, yet readily recognizable. In the palest individuals the whole body is yellow, only a very small dot immediately above the base of the wings and the tip of the borer being black. In darker individuals, the following markings appear successively: 1. A black double spot in the middle of the anterior border of the thorax; 2. A black spot on each side of the scutellum; 3. A broad black stripe on each side of the metanotum; 4. The black posterior portion of the lateral stripes; 5. The black anterior portion of the lateral stripes; 6. The double stripe in the middle of the thorax, abruptly ending in its centre. The head is rather bright yellow; front very prominent, face much receding; opening of the mouth not widened; palpi and proboscis short, yellow, the bristle with a very short pubescence. Frontal bristles black, the superior ones considerably stout, two of them on each side in the male assume the shape of straight spines, a little incrassated at their tips; in smaller males, however, these spines are not seldom only little stouter than in the females, and of the ordinary form. The lateral border of the thorax and the superior border of the pleuræ may have a pale yellow color in life; in dry specimens they are very whitish. From the pale yellow scutellum a broad pale yellow stripe extends to about the middle of the thorax. Hairs and bristles of the thorax black. Scutellum with four black bristles. Abdomen proportionately very narrow, with rather long black hairs. Borer about half as long as the abdomen, with the tip only blackened. Legs yellow, anterior femora with black bristles on the under side. Wings narrow and very long, more elongated and pointed in the males than in the females, but not always in the same degree; the brownish-yellow stripes and bands leave the following clear spots: 1. A space near the costal border between the transverse humeral vein and the tip of the auxiliary vein, and having usually a brownish spot in its middle; 2. An oval space immediately below the stigma between the third and fourth longitudinal veins; 3. A triangular space immediately beyond the tip of the first longitudinal vein, and reaching from the costal border as far as the third longitudinal vein; 4. An arcuated band running obliquely from the costal border between the two transverse veins as far as the fifth longitudinal vein; 5. A triangular space on the posterior border filling up the second posterior cell, with the exception of an edge along the veins; 6. An arcuate oblique semifascia beginning on the posterior border before the tip of the fourth longitudinal vein, and running as far as the third longitudinal vein; 7. The alary appendage, the posterior angle of the wing, and a large space adjoining it, and lying before the last longitudinal vein. The transverse humeral vein, and the space of the costa near it, are usually black as well as the space of the latter, where the costal spine is inserted. The brownish-yellow bands of the wings have narrow brown edges, and are in a greater or less extent brown near the tip and the posterior border of the wings. There are specimens in which the bands are much more extended, but those having a part of them obsolete are more common; this fading of the picture of the wings is most frequent in the neighborhood of the posterior border. The posterior transverse vein is a little oblique; the tips of the third and fourth longitudinal veins are curved. The circumference of the wings is not always the same in the males; those the frontal bristles of which are most thickened appear to have the most prolonged and pointed wings.

Hab. Middle States. (Osten-Sacken.)

Observation.—I have had an opportunity of examining the typical individuals of *Tryp. longipennis* Wied.

3. T. fratria Loew. ♀. (Tab. II, fig. 4.)—Tota lutea, thorace non vittato, alarum rivulis fasciisque luteo-fuscanis, maculam ovatam pellucidam in posteriore cellulæ discoidalis parte includentibus, venâ longitudinali tertiâ setosâ.

Totally luteous yellow; the thorax without stripes; the wings with brownish-yellow rivulets and bands, including an ovate pellucid spot in the posterior part of the discal cell; the third longitudinal vein with bristles. Long. corp. 0.22. Long. al. 0.22.

Rather dark yellow with the scutellum paler and an almost whitish-yellow, not sharply limited stripe, running from the shoulder to the base of the wing; the metanotum at each side with a dot-like black spot. Front of moderate breadth. Antennæ yellow, little longer than half the face, with the bristle apparently bare. Face receding only a little, and slightly excavated below the antennæ. Proboscis short; palpi slightly projecting. Bristles of the thorax black. Hairs of the abdomen short and black. Borer very short, not flattened, concolorous with the abdomen. Legs yellow, tibiæ and tarsi paler than the femora; anterior femora with some black bristles on the underside. The picture of the wings is yellowish-brown, and of the same form as that of the European *Tryp. Heraclei* Linn. The part of it adjacent to the base of the wings reaches from the costal border as far as the dark brownish stigma, having, however, between the transverse humeral vein and the tip of the auxiliary vein a rather large and almost hyaline space; it includes between the third and fourth longitudinal veins an oval transparent spot near the base of the discal cell; it covers the whole of the two posterior basal cells and fills up the two first thirds of the discal cell, running then in a darker color behind the fifth longitudinal vein as far as the tip of this vein, from whence forming a band, it rises above the posterior transverse vein and is connected with the remaining picture in the neighborhood of the small transverse vein. From the latter place a band runs obliquely to the costal border, where it seams the tip of the wing and proceeds as far as the tip of the fourth longitudinal vein; on the third longitudinal vein it emits a parallel branch running to the posterior border. .The last portion of the third longitudinal vein is only slightly curved; the posterior transverse vein is slightly oblique; the small transverse vein is perpendicular and more than one and a half of its length from the posterior transverse vein.

Hab. United States. (Osten-Sacken.)

Observation 1.—*Tryp. fratria* resembles exceedingly the yellow variety of *Tryp. Heraclei* Linn., and agrees with it especially in the picture of the wings; but it differs from it by its shorter and proportionately broader wings, by the greater distance between the two transverse veins, and the curve of the last portion of the third longitudinal vein, which is less considerable. I found also the borer of the palest females of *Tryp. Heraclei* always black, whereas its color in *Tryp. fratria* agrees with that of the abdomen.

Observation 2.—I have been of the opinion for some time that this species might be *Tryp. varipennis* Macq., but after a closer examination I find this not admissible, since in Macquart's figure (Dipt. exot. II, 3, Tab. XXXI, f. 1) the band rising from the posterior border and seaming the posterior transverse vein includes a large clear space behind the fifth longitudinal vein, which does not exist in *Tryp. fratria*, and the penultimate band is united with the first near the second longitudinal vein, whereas in *Tryp. fratria* this union takes place at the third longitudinal vein. The statement of the metanotum of *Tryp. varipennis* being black, whereas in my specimen of *Tryp. fratria* it is marked with a black dot on each side only, could not be considered as decisive for separating the two species, since the species of this group are very variable in their colors.

4. T. suspensa Loew. ♀. (Tab. II, fig. 5.)—Tota lutea, thorace non vittato, alarum fasciis fuscanis obliquis, postice divergentibus, venâ longitudinali tertiâ setosâ.

Totally luteous yellow; the thorax not striped; the wings with oblique brownish bands diverging posteriorly; the third longitudinal vein with bristles. Long. corp. 0.21. Long. al. 0.22—0.23.

Dark yellow. Front purer and paler yellow; frontal bristles black, rather short, and not very stout. Antennæ yellowish, almost as long as the face, with the bristle very thin, and having a very delicate and short pubescence. Face a little receding, with proportionately rather deep furrows for the reception of the antennæ. Opening of the mouth rather widened; border of the mouth sharp. Proboscis rather thick, with the suctorial flaps a little prolonged. Palpi broad. Upper side of the thorax without stripes; its pubescence yellow and exceedingly short, bristles black. Scutellum with four black bristles. Metanotum colored alike with the rest of the body. Hairs of the abdomen short and pale, but the bristles at its end black. Legs yellow; anterior femora not very stout, with some black bristles on the under side. Wings not very long; their markings are mostly yellowish-brown, and leave the following hyaline spots: 1. A small triangular one on the costal border immediately behind the tip of the first longitudinal vein, reaching as far as the third longitudinal vein, and joining there a hyaline spot which lies below the stigma between the third and fourth longitudinal veins; 2. An oblique band slightly curved, which rises on the posterior border, near the tip of the last longitudinal vein, and ascends between the transverse veins as high as the third longitudinal vein; 3. A triangular spot of the posterior border, occupying the greater part of the second posterior cell, and reaching with its apex to a little beyond the fourth longitudinal vein; 4. An oblique band which begins at the posterior border, immediately beyond the tip of the fourth longitudinal vein, and ascends as high as the second longitudinal vein, so that the two oblique clear bands almost meet with their anterior ends. The small transverse vein is at the end of the second third of the discal cell, and, like the posterior transverse vein, has a slightly oblique position; the end of the fourth longitudinal vein is distinctly curved forwards; the posterior angle of the anal cell is drawn out into a long point.

Hab. Cuba. (Poey.)

5. T. unicolor Loew. ♀. (Tab. II, fig. 6.)—**Flava, thoracis vittis scutelloque multo pallidioribus, fasciis alarum fusco-flavescentibus, postice divergentibus, venâ longitudinali tertiâ setosâ.**

Yellow, the stripes of the thorax as well as the scutellum much paler; the brownish-yellow bands of the wings diverging posteriorly; the third longitudinal vein with bristles. Long. corp. 0.26. Long. al. 0.27.

Rather pale yellow. Front a little brighter, of moderate breadth; frontal bristles black, the superior ones rather stout. The yellowish antennæ are nearly as long as the face, bristle very short, beset with a very short and delicate pubescence. Face a little receding, the furrows for the reception of the antennæ proportionately rather deep. Opening of the mouth rather widened, border of the mouth sharp. Proboscis rather thick, with the suctorial flaps slightly prolonged; palpi broad. The upper side of the thorax, above the base of the wings, shows a stripe running from the suture to the posterior border of the thorax, and has in the described specimen rather a whitish color, which seems to have been pale yellow in the living insect; of the same color are the shoulder and the space behind it, the scutellum and a large spot above the poisers; a broad stripe of the same color seems to run from the middle of the posterior border of the thorax to nearly its middle. The dark stripes usual in other species are indicated by rows of blackish spots; they may, however, have become visible only after the drying up of the insect. The short hairs of the thorax are pale yellowish, the bristles black. Scutellum with four black bristles. Metanotum with a black stripe on each side. Abdomen with pale, very short hairs and brownish-black bristles at its end; last segment a little prolonged, with an indistinct brown longitudinal line on each side. Legs yellow; anterior femora with some brown bristles on their under side. Wings rather large; the bands are brownish-yellow with brown edges, entirely brown near the posterior border and the tip of the wing; the clear spaces which they leave are as follows: 1. A very oblique one, interrupted on the third longitudinal vein, with its anterior end forming a triangular spot, placed beyond the tip of the first longitudinal vein, and running through the base of the discal cell as far as the base of the posterior basal cell; 2. A band, having the form of an S, rising on the posterior border, near the tip of the last longitudinal vein, and, after running between the transverse veins, ascending as high as the second longitudinal vein, from whence it turns again to the posterior border, which it joins in the neighborhood of the tip of the fourth longitudinal vein; 3. A large triangular spot of the posterior border, which occupies a great portion of the second posterior cell, and with its tip reaches beyond the fourth longitudinal vein. The stigma is long and rather dark brownish. Transverse veins straight and steep; the fourth longitudinal vein is distinctly curved forwards at its end, as in *Tryp. parallela* Wied.; the posterior angle of the anal cell is drawn out into a large point.

Hab. New Granada. (Schott.)

6. T. electa Say. ♀. (Tab. II, fig. 7.)—Flava, thoracis vittis scutelloque multo pallidioribus, alis fuscano-fasciatis, venâ longitudinali tertiâ setosâ, tibiis posticis nigro-ciliatis.

Yellow, the stripes of the thorax as well as the scutellum much paler; the wings with straight brownish bands; the third longitudinal vein with bristles and the upper side of the posterior tibiæ ciliated with black bristles. Long. corp. 0.29. Long. al. 0.29.

Syn. *Trypeta electa* Say, Journ. Acad. Philad. VI, 185, 1.
Tephritis flavonotata Macquart, Dipt. exot. Suppl. V, 125. Tab. VII, fig. 9.

This very distinct species has in the picture of the wings a great resemblance with the European *Tryp. alternata* Fall. Yellow. Front of middling breadth; frontal bristles black, rather stout. Face slightly receding, with rather deep furrows for the reception of the antennæ. Antennæ yellow, reaching only a little beyond the middle of the face; the bristle bare and very thin. Opening of the mouth large, but not widened; border of the mouth rather sharp, but not projecting. Proboscis small; palpi rather broad. On the upper side of the thorax there is a pale yellow (almost ivory color in the dry specimen) stripe running from the shoulder to the base of the wing, and a second above the base of the wing running from the suture as far as the posterior border of the thorax. Another stripe of the same color runs from the middle of the posterior border to beyond the middle of the thorax, where it is gradually pointed and obliterated; the stripe lying above the base of the wing is interiorly edged with black in the described specimen. Hairs of the thorax short, pale yellowish; bristles black. Scutellum of the color of the pale stripes of the thorax and a black spot on each side of the base of the lateral border; it has four bristles. Pleuræ with a pale yellow longitudinal stripe in its middle and two black little spots above it. Abdomen yellow, with short black hairs and black bristles on the posterior borders of the two last segments; the last segment has a dot-like black spot on each side near the base. Borer short, thick, not flattened at all, a little rounded at its end, of the color of the abdomen, and covered with black hairs. Legs yellowish; anterior femora with black bristles on their under side; the under side of the middle and posterior femora with some black bristles only near the tip, the bristles being shorter on the middle femora; the posterior tibiæ on their whole upper side are densely fringed with rather long black bristles, which afford a very characteristic mark of this species. Wings hyaline, with brown bands. The first of these bands is the least regular, and runs from the transverse humeral vein as far as the end of the anal cell, the posterior angle of which is drawn out into a long point; this anal cell, as well as the basal cell lying before it, is brownish-yellow. The second band, beginning with the short stigma, runs over the small transverse vein, and, after crossing the discal cell, reaches the posterior border, on which it is connected more or less distinctly with the posterior end of the following band. The latter begins on the costal border before the tip of the second longitudinal vein, and after running over the posterior transverse vein in a straight direction, reaches the posterior border of the wing. Its anterior end is perfectly connected with the last band, which seams the wing as far as a little beyond the tip of the fourth longitudinal vein. Between the second and third bands there is still a yellowish-brown line drawn perpendicularly from the costal border to the third longitudinal vein. Transverse veins straight; the small transverse vein is a little beyond the middle of the discal cell.

Hab. Florida. (Osten-Sacken.)

7. T. insecta Loew. ♀. (Tab. II, fig. 8.)—Thorace nigro, capite, abdomine pedibusque luteis, alarum nigrarum incisuris marginalibus guttulisque inter venarum longitudinalium tertiam et quartam tribus vel quatuor pellucidis, venâ longitudinali tertiâ nudâ, setis scutelli duabus.

Thorax black; head, abdomen, and legs luteous; wings black, with limpid incisions on the borders, and three or four limpid drops between the third and fourth longitudinal veins; third longitudinal vein bare; scutellum with two bristles. Long. corp. 0.14. Long. al. 0.14.

Of the group of the European *Tryp. rotundiventris* Fall. Head dirty yellow. Front rather narrow, more so towards its anterior end; frontal bristles brown; the row of rather long bristles at the posterior orbit whitish. Antennæ yellowish, nearly as long as the face. Cheeks descending only a little below the eyes. Thorax and scutellum black, the neighborhood of the coxæ brown. Hairs of the thorax short, pale yellowish, bristles brown. Scutellum with two long brown bristles. Abdomen brownish-yellow; borer not quite so long as the two last segments united, much broader at the base, broad and abrupt at the end, flattened, concolorous with the abdomen. Legs yellow. Wings black, with pellucid spots. On the costal border there is a small spot before the transverse humeral vein; a similar spot projecting a little from the first longitudinal vein lies beyond the transverse humeral vein, and a smaller one between it and the tip of the auxiliary vein; it is followed by two triangular spots of equal size, the first of which is immediately beyond the tip of the first longitudinal vein, and touches the third longitudinal vein at its junction with the small transverse vein. On the posterior border of the wing there are six clear excisions, the two first of which coalesce with the grayish hyaline axillary angle of the wing; the third reaches the fifth longitudinal vein; the fourth lying behind the tip of the fifth longitudinal vein is more cloudy than the others, and goes a little beyond the fifth longitudinal vein; the fifth accompanies the steep posterior transverse vein at its hind side, and reaches as far as the fourth longitudinal vein; the sixth has a more inclined position and a sharper tip, with which it reaches the fifth longitudinal vein. In the middle of the broad first posterior cell there is a considerable hyaline drop; a much smaller drop is seen at the anterior side of the fourth longitudinal vein, in the middle of its penultimate portion, and one or two hardly visible drops at the antepenultimate portion of this vein. The second longitudinal vein is slightly undulating, and diverges more than usually towards the end from the third longitudinal vein; the posterior angle of the anal cell is drawn out into a prolonged point.

Hab. Cuba. (Poey.)

8. T. palposa Loew. ♀. (Tab. II, fig. 9.)—Flava, abdomine punctorum nigrorum seriebus quatuor picto, alis hyalinis luteo-fasciatis, venâ longitudinali tertiâ nudâ.

Yellow, abdomen with four rows of black dots, wings hyaline with luteous bands and the third longitudinal vein bare. Long. corp. 0.26—0.27. Long. al. 0.26.

It is nearly allied to *Tryp. arctii* Deg., *lappæ Cederh*, etc. Yellow; front brighter yellow, rather broad; frontal bristles blackish, the small bristles of the posterior orbit whitish. Antennæ yellow, descending a little beyond the middle of the face, their third joint rather broad; the bristle of the antennæ apparently bare, with the base slightly incrassated. Face a little receding, excavated in the middle, so that the border of the mouth is projecting; the furrows for the reception of the antennæ rather flat. Opening of the mouth very wide; proboscis thick and short; palpi broad, rather large, with some small black bristles. Thorax with a large glossy black spot in the middle of its anterior side; its upper side blackish, with the exception of the lateral and posterior borders, and of a large triangular spot which rises from the posterior border; hairs whitish-yellow; bristles blackish; two of the latter, inserted before the scutellum, are placed on larger black dots, and two before them on smaller dots. Scutellum with four bristles, yellow, only a little blackened at the base of the lateral border. Metanotum black. Pleuræ with some brown spots, and above the posterior coxæ with a small black spot. The third, fourth, and fifth segments of the abdomen have each at its anterior border four small black spots, the intermediate ones being more approximated; the fifth segment is much prolonged, and has, moreover, a black spot in each posterior corner. The rather coarse hairs of the abdomen are yellowish on the first segments and the anterior part of the middle ones, the remaining ones are black. Legs yellow; anterior femora with black bristles on the under side. The color of the picture of the wings is brownish-yellow in my specimen, which is apparently a little faded; it extends on the costal border from the base to the tip of the first longitudinal vein, and, on the first portion of this extent, reaches as far as the fourth longitudinal vein, and on the second half as far as the third only. From the tip of the first longitudinal vein a band runs over the small transverse vein; a second band runs from the costal border over the posterior transverse vein; these two bands become more obsolete towards the posterior border, and almost coalesce in its neighborhood. The first of them is also connected with a stripe which edges the fifth longitudinal vein. The edge of the tip of the wing is perfectly connected with the second band, and reaches a little beyond the tip of the fourth longitudinal vein. The anal cell is brownish-yellow. Transverse veins steep; the small transverse vein a little before the last third of the discal cell.

Hab. Northern Wisconsin. (Kennicott.)

9. T. suavis Loew. ♂. (Tab. II, fig. 10.)—Pallide flava, unicolor, alarum hyalinarum liturâ basali fasciisque tribus nigricantibus in formam literæ S confluentibus, venâ longitudinali tertiâ nudâ.

Pale yellow, unicolorous; wings hyaline, with a blackish basal stripe and three blackish bands confluent in an S-shaped mark; third longitudinal vein naked. Long. corp. 0.20. Long. al. 0.21.

Of this species, very conspicuous by the peculiar picture of its wings, I unfortunately possess only one individual, much injured in carrying. It is everywhere pale yellow, and its thorax and scutellum have no trace of a paler picture. Hairs very short, whitish-yellow on the upper side of the thorax, rather blackish on the pleuræ; bristles all black. Scutellum with four bristles. Wings hyaline; the veins at the base of the wing yellowish; a blackish not very striking stripe runs from the tip of the basal humeral vein to the posterior angle of the anal cell, which is drawn out into a point. The remainder of the picture of the wings consists of three very broad, rather blackish bands; the first runs from the black stigma, widening gradually perpendicularly to near the posterior border, where it is connected with the second, which rises over the posterior transverse vein as far as the costal border, and connects there completely with the third band which seams the tip of the wing. The connection of the first and second bands is somewhat interrupted by a clear incision reaching from the posterior border a little into the discal cell. Above the end of this incision there is another clear spot. Stigma small; none of the longitudinal veins unusually curved; the small transverse vein is somewhat before the middle of the discal cell and below the very tip of the first longitudinal vein; the posterior transverse vein is only a little arcuated; the two transverse veins are steep, not perfectly perpendicular.

Hab. Middle States. (Osten-Sacken.)

10. T. cingulata Loew. ♀. (Tab. II, fig. 11.)—Nigra, capite pedibusque luteis, thoracis margine laterali scutelloque flavis, margine segmentorum abdominalium singulorum postico albido, alarum hyalinarum fasciis quatuor punctoque apicali nigris.

Black with the head and legs luteous, the lateral borders of the thorax and the scutellum yellow, the posterior borders of the abdominal segments whitish; wings hyaline with four bands and an apical dot black. Long. corp. 0.22. Long. al. 0.20.

It belongs to the relationship of the European *Tryp. cerasi* Linn. (= *signata* Meig.), a group which must not be confounded with that of *Tryp. solstitialis* Linn., closely alike in its coloring. Black. Head rather dark yellow, front brighter yellow, of middle breadth, with rather long black bristles. Antennæ reaching to a little beyond the middle of the face, last joint rather narrow, and with the anterior corner rather sharp. Face straight, descending, with moderately deep furrows for the reception of the antennæ; border of the mouth by no means prominent. Proboscis and palpi short. Thorax black; the humeral callosity and a longitudinal stripe running from the latter to the base of the wing are bright yellow. The bristles of the thorax and the four bristles of the yellow scutellum black; the base and greatest part of the lateral border of the latter black. Metanotum and abdomen glossy black, the latter with broad whitish (perhaps more yellow in life) edges of the posterior borders and black hairs. Borer exceedingly short. Legs dark yellow; femora a little brownish at the base; the anterior femora with small brown bristles on the under side; the two posterior tibiæ with short black bristles on the upper side. Wings somewhat broad, especially in the neighborhood of the base, with four black bands and a little black spot at the tip. The first band runs from the basal humeral vein to the posterior angle of the anal cell, which is drawn out into a point. The second is broadest, running from the black stigma beyond the fifth longitudinal vein, and ending abruptly in the middle between this vein and the border of the wing. The third, which runs over the posterior transverse vein, is also rather perpendicular, and completely reaches the posterior border of the wing. The fourth band is perfectly united with the third on the costal border, and reaches the posterior border behind the tip of the fourth longitudinal vein, so that it has a rather oblique position. The small apical spot includes the tip of the third longitudinal vein. Both transverse veins are straight and perpendicular.

Hab. Middle States. (Osten-Sacken.)

11. T. polita Loew. ♀. (Tab. II, fig. 12.)—Atra, nitida, capite pedibusque flavis, scutello tumido, alarum albido-hyalinarum maculâ basali atrâ fasciisque tribus latissimis fusco-nigris.

Deep black, shining; head and legs yellow, scutellum inflated; wings whitish-hyaline with a basal black spot and three very broad brownish-black bands. Long. corp. 0.25. Long. al. 0.17—0.18.

Belongs to the relationship of the European *Tryp. Wiedemanni* Meig., the species of which chiefly agree in their inflated scutellum and short wings, while they differ among each other much in the structure of their face. Front bright yellow, beautifully yellowish-brown above, considerably broad; frontal bristles black. Antennæ yellowish, descending to the middle of the face, and having a black bristle, the pubescence of which is exceedingly short and hardly visible. Face whitish-yellow, a little receding, its middle rather flat; border of the mouth not prominent at all; opening of the mouth rather small; proboscis and palpi short. The inferior part of the occiput is whitish-yellow, the superior blackish. Thorax rather convex, altogether glossy black, bare, but the broad lateral stripes are bordered everywhere with a row of yellowish short hairs, and the broad middle stripe is divided by a longitudinal row of such hairs. Bristles black. Scutellum shining black, very convex, as if inflated. Metanotum black, with an indistinct whitish reflection. Pleuræ shining black, with a few stiff yellowish hairs and some black bristles. Abdomen black; the hairs rather stiff, whitish on the posterior part of the first segment; on the second and third segments they are black, except the hindmost ones of the posterior border, which are whitish; on the two last segments they all are whitish. Borer shining black, flattened, pointed, abundantly as long as the abdomen, with very short black hairs. Legs dirty fuscous-yellow; femora not much incrassated, the anterior ones with a few black hairs on the under side. Wings short and rather broad, having the transverse veins very approximated and perfectly perpendicular; they are rather whitish, with very broad brownish-black bands. Their innermost base is yellowish, then follows a large triangular rather deep black spot, which reaches from the costal border as far as the axillary incision of the wing, and only little exceeds the basal cells. The two first black or brownish-black bands are united on the costal border, so as to form an inverted V; the second of them runs from the stigma over the transverse veins, and has a more inclined position than the first; the isolated third band has a position similar to that of the second, and seams the tip of the wing some distance beyond the tip of the fourth longitudinal vein, without coalescing anywhere completely with the border of the wing.

Hab. Mississippi. (Schaum.) Washington. (Osten-Sacken.)

Observation.—The Brazilian *Urophora connexa* Macq. (Dipt. exot. Suppl. III, 64, Tab. VII, fig. 10) has the picture of the wings rather similar to those of *Tryp. polita*. But being greenish-black, and having the last band of the wings completely connected with the preceding, and running straight on with the costal border, but not reaching the tip of the third longitudinal vein, it is evidently different from *Tryp. polita.*

12. T. sparsa Wied. ♂ and ♀. (Tab. II, fig. 13.)—Fusca, alis latissimis, rotundatis, nigris, albido-guttulatis et margine apicali albo ornatis.

Brown; wings very broad and rounded, black with small drops, and the apical border whitish. Long. corp. 0.27—0.30. Long. al. 0.26.

Syn. *Trypeta sparsa* Wiedemann, Auss. Zweifl. II, 492.
Trypeta caliptera Say, Journ. Acad. Phil. VI, 187, 3.
Platystoma latipennis Macquart, Dipt. exot. II, 3, 200. Tab. XXVI, fig. 8.
Acinia novæboracensis Fitch, First Rep. etc. 67.

Of a brownish-red, sometimes more brown color. Front broad, brownish-yellow, frontal bristles black; the bristles of the posterior orbit whitish-yellow. Antennæ descending below the middle of the face, their bristles with a short, but distinct pubescence. Face excavated in the middle, and marked with two large deep black dots; another small deep black spot is between the antenna and the anterior angle of the eye. Eyes with three very distinct transverse bands. Palpi dark brown, usually blackish at the tip; suctorial flaps a little prolonged. On the upper side of the thorax there are usually two or three darker longitudinal lines, and a broad dark-brown edge of the lateral border. The short hairs of the thorax and scutellum are whitish-yellow, the bristles of both black. Of the four bristles placed in the middle of the thorax, the two first are near the transverse suture. Pleuræ above with whitish-yellow, below with black hairs, the bristles mixed among them black. The abdomen usually bears two rows of large blackish spots, of a rather quadrangular form, leaving between them a brown middle streak, and not completely reaching the posterior borders of the single segments; sometimes they extend so much, that only the posterior borders of the segments retain a paler color, whereas the whole surface is blackish. Borer blackish-brown, sometimes with a red spot on each side, a little pointed, rather flat; its first segment is a little longer than the two last segments of the abdomen taken together. The hairs of the abdomen are mostly black, a few light ones being among them. Legs paler reddish-brown, the anterior femora often partly blackened, with some black bristles on the upper and under sides. Wings exceedingly broad, with the uninterrupted whitish seam of the tip forming a narrow crescent; on their surface there are numerous clear drops rather equally scattered, but totally wanting in that part of the black color which adjoins the white crescent, as well as before the first longitudinal vein. At the tip of the first longitudinal vein, a small, clear, but little distinct stripe is seen. The small transverse vein straight and perpendicular, the posterior one a little curved and steep.

Hab. Northern Wisconsin. (Kennicott.)

Observation.—I possess a specimen, which is distinguished by its much paler, almost dull testaceous color, its less enlarged wings and the somewhat larger size of the clear drops, but as to the other characters agrees so perfectly with the ordinary specimens of *Tryp. sparsa* Wied. that I do not venture to declare it a different species.

13. T. rotundipennis Loew. ☿. (Tab. II, fig. 14.)—Fusca, alis latissimis, rotundatis, nigris, albido-guttulatis et in marginibus anteriore et apicali maculas minutas albidas gerentibus.

Brown; wings broad and rounded, black, with very small whitish drops in the middle, and small whitish spots on the costal and apical borders. Long. corp. 0.28. Long. al. 0.26.

Of this species I have only one specimen, which is unfortunately so much injured in the journey as to prevent me from giving a full description. However, as it is very nearly related to *Tryp. sparsa* Wied., it will be recognized even from my incomplete description. The color is the same; the wings are still shorter and broader, especially the cell which lies before the first longitudinal vein is much broader; the third longitudinal vein is much more undulated, and the last portion of the fourth longitudinal vein is shorter than the posterior transverse vein, whereas it is a little longer in *Tryp. sparsa.* None of the drops on the wings of *Tryp. sparsa* is of a more considerable size than the others, whereas *Tryp. rotundipennis* has such a drop between the third and fourth longitudinal veins, opposite to the base of the discal cell; the drops are in general equally distributed in *Tryp. sparsa*, they are much more irregularly grouped in *Tryp. rotundipennis;* the size and number of the drops diminishes a little from the base towards the apex in *Tryp. sparsa;* their number only, not their size diminishes in *Tryp. rotundipennis;* their size increasing towards the posterior border in *Tryp. sparsa*, this is not the case in *Tryp. rotundipennis.* In *Tryp. sparsa* the white crescent seaming the apex of the wing is entire, in *Tryp. rotundipennis* it is dissolved into several spots. Finally, the anterior border of the wings of *Tryp. rotundipennis* bears a row of small clear spots, whereas *Tryp. sparsa* has no trace of them.

Hab. Middle States. (Osten-Sacken.)

14. T. clathrata Loew. ♀. (Tab. II, fig. 15.)—Cana, capite pedibusque flavis, femoribus litura nigra signatis, alis rare reticulatis, stigmate atro albo-guttato, peristomio modice producto, proboscide breviter geniculata.

Whitish-gray; head and legs yellow; wings with a diffuse reticulation, and the black stigma including a limpid drop; oral border moderately prolonged, proboscis shortly geniculated. Long. corp. 0.12 Long. al. 0.13.

Head yellowish; the lateral borders of the front, the face, and the much descending cheeks whitish. The bristles on the front black, on the sides of the vertex and posterior orbit white. The face with rather deep subantennal furrows prolonged to the oral border, which is not very projecting. Antennæ fulvous, rather short; the anterior corner of the third joint a little acute; the second joint with very short black hairs; antennal bristle black and moderately long, with the pubescence scarcely visible. Thorax and scutellum whitish gray, with short pubescence and black bristles. The scutellum bears four bristles, the two apical ones being much shorter and less stout than the lateral ones; its tip is sometimes yellow. The whitish-gray abdomen has two rows of very distinct black spots. The hair and even the bristles on the hind border of the last segment are white. The flat ovipositor is glossy-black, as long as the two last segments of the abdomen and moderately tapering towards the tip. The legs and anterior coxæ are dark yellow, with white hairs; the thighs with a blackish stripe somewhat covered with whitish dust. Wings not very narrow, hyaline, with the base very slightly yellowish; their black reticulation is not very dense and not very delicate, extending towards the base of the wing as far as the base of the discal cell, and dissolving towards the axillary angle into some scattered spots; stigma black, with a whitish dot; the middle and posterior transverse veins rather approximate.

Hab. Middle States. (Osten-Sacken.)

Observation.—The proboscis of this species being short with the suctorial flaps but moderately prolonged, attention is to be paid to its true place, which is among the species with a geniculated proboscis.

15. T. humilis Loew. ♂. (Tab. II, fig. 17.)—Cinerea, capite pedibusque flavis, femoribus nigris, alis rare reticulatis, stigmate atro non guttato, peristomio valde producto, proboscide geniculata.

Cinereous; head and legs yellow, with the femora black; reticulation of the wings diffuse, and the black stigma including no limpid drop; oral border much prolonged; proboscis geniculated. Long. corp. 0.09. Long. al. 0.1.

Among the kindred of the European *Tryp. elongatula* Loew, but in its habit more resembling *Tryp. absinthii* Fabr. Head yellow, considerably prolonged anteriorly. Front yellow, distinctly margined with white at the orbit; frontal bristles black. Face excavated with the anterior border of the mouth much prolonged. Antennæ bright yellow, proportionately large and broad, reaching as far as the prolonged border of the mouth; the anterior corner of the third joint a little pointed; the second joint with very short black hairs; antennal bristles very long, black, with a very short and hardly visible pubescence. Thorax and scutellum yellowish ashy-gray with short whitish-yellow hairs and black bristles. In the middle of the thorax there are four bristles, the two foremost being very near the suture. Scutellum with only two long bristles rather distant from the tip and not close by its lateral border. Metanotum black with grayish pollen. Abdomen ashy-gray with two rows of rather large blackish spots. Its hairs are whitish yellow; some black bristles on the posterior border of the prolonged last segment. Tip of the first joint and the second joint of the coxæ rather dark yellow. Femora brownish-black, with dark yellow tips. Tibiæ and tarsi dark yellow. Wings proportionately rather long and narrow. Their reticulation is black, rather diffuse and coarse; the base of the wing as far as the base of the discal cell has no reticulation. The black stigma includes no clear dot. Moreover, the reticulation of the wings is somewhat variable. Transverse veins rather near each other.

Hab. Cuba. (Poey.)

Observation.—I have a female likewise captured in Cuba, which, I think, belongs to the present species. It resembles the male in everything but the femora, which are darkened to a much smaller extent, and not with black, but brown. The borer is black, flat, about as long as the two last segments of the abdomen taken together.

16. T. solidaginis Fitch. ♂ and ♀. (Tab. II, fig. 16.)—Rufo ferruginea, capite pedibusque flavioribus, fronte latissimâ, setis scutelli valde convexi duabus, alis fusco-reticulatis, incisuris una anteriore, duabus posterioribus apiceque hyalinis, parcissime fusco-maculatis.,

Brownish-ferruginous with the head and legs more yellow; front very broad; scutellum very convex with two bristles. Wings reticulated with fuscous having one limpid space at the costa and two at the posterior border scarcely dotted with fuscous. Long. corp. 0.26. Long. al. 0.26.

Syn. *Acinia solidaginis* Fitch. First Rep. 66.

This remarkable species, which, according to Mr. Fitch, produces round galls on the stems of Solidago, has no near relations among the European *Trypetæ*. In consequence of the extraordinary breadth of its front, the breadth and convexity of its thorax, and the inflation of its large scutellum, it has the appearance of a large *Lipara*. It is brownish ferruginous. Head more yellow, face almost whitish. The bristles of the unusually broad front are black, smaller and weaker than in most other species, so that one might easily be tempted to refer the species to the *Ortalidæ*, if the structure of the auxiliary vein did not prove that it belongs here. Face deepened in the middle, prominent again underneath. Antennæ yellow, short and broad, the third joint having a rather distinct, but not sharp anterior corner; bristle of the antennæ with a hardly visible pubescence. Opening of the mouth very wide; palpi and proboscis short. Thorax very convex and broad; on its upper side in the middle usually a double stripe ending abruptly behind, the posterior part of the lateral stripe and a longitudinal streak above the base of each wing, black. The short hairs of the thorax are whitish yellow, its delicate bristles black. Scutellum very convex, quite blunt; the posterior pair of bristles which in most species exists at the tip, is here always wanting so that there is only one bristle on each side near the lateral border; a second weaker bristle is seldom inserted immediately beside it. Abdomen broad, especially in the male, which has also the last segment a little prolonged and rounded. Borer of the female a little longer than the two last segments taken together, moderately broad, and quite flat, red, blackened at its extremity. Legs rather dirty yellow, femora more brownish. Wings rather large and of more equal breadth than usual. The reticulation of the wings is almost umber brown with small pale brownish drops and hyaline marginal spots very rarely dotted with brown; the first of these spots is triangular and extends from the posterior border to inside of the discal cells; the second is much smaller, but also of triangular form, and reaches with its tip to the fourth longitudinal vein; the third forms a margin along the apex of the wing, reaching from the tip of the second longitudinal vein to the tip of the fourth longitudinal vein; the last spot forms a small oblique triangle extending from the costal border to the third longitudinal vein, and lying immediately beyond the tip of the first longitudinal vein. A costal spine does not exist. The first longitudinal vein is more hairy than bristly; the transverse veins are perpendicular; the small transverse vein is almost at the end of the second third of the discal cell; the hind angle of the anal cell has only a short point.

Hab. New York. (Dr. Fitch.) Washington. (Osten-Sacken.)

Observation.—This species has so many peculiarities, that it might easily be considered as the type of a new genus. The broad front, broad and convex thorax, a scutellum having only two bristles, the first longitudinal vein alone being hairy, and the absence of the costal spine, would be its most essential characters.

17. T. seriata Loew. ♂. (Tab. II, fig. 18.)—Flava, alis concoloribus, per maculas minutas nigricantes, seriatim dispositas, reticulatis et nigrolimbatis.

Yellow; wings of the same color, margined with black and reticulated with small blackish spots, arranged in longitudinal rows. Long. corp. 0.24. Long. al. 0.26—0.27.

Rather bright yellow, quite unicolorous, the hairs and bristles also yellow, the latter, however, appearing brown when seen in a certain light. Front rather broad. Face descending rather straight, strongly excavated, however, in its middle. Proboscis short; palpi rather broad and short. Scutellum with four bristles. The wings are proportionately long, and of very equal breadth. Their yellow ground color is rather obsolete in the middle line of the cells and on the posterior border. The reticulation of the greater part of the wings is effected by blackish angular specks arranged in two rows between each two veins; only the axillary angle has a connected blackish-gray reticulation formed by clear drops. Immediately before the tip of the auxiliary vein begins the black margin of the wing, which encompasses the apex and proceeds to the axillary angle, growing gradually paler in its progress, and meeting several interruptions; the most remarkable of these interruptions are a rather hyaline spot immediately beyond the tip of the first longitudinal vein, and a row of similar round spots along the posterior border, the two first of which in the second posterior cell, the following more frequent towards the axillary angle. The third longitudinal vein bears very distinct bristles from its base as far as the small transverse vein. The small transverse vein is nearly at the end of the second third of the discal cell. The posterior transverse vein is not quite perpendicular. The hind angle of the anal cell is prolonged into a moderately long point.

Hab. Middle States. (Osten-Sacken.)

18. T. solaris Loew. ♀. (Tab. II, fig. 19.)—Cana, capite pedibusque luteis, puncto humerali et altero ante alarum basim flavis, alis albohyalinis, macula magnâ subapicali nigrâ, biguttatâ et radios octo emittente, ornatis.

Whitish gray; head and legs luteous, a dot on the shoulder and another before the base of the wings yellow; wings whitish hyaline, with a subapical black spot including two limpid drops and emitting eight rays to the border of the wing. Long corp. 0.17. Long. al. 0.16—0.17.

One of the group of the European *T. stellata* Fuessl., *cometa* Loew, *gnaphalii* Loew, etc., and very much resembling these species. Head yellow; front rather broad; frontal bristles blackish; the bristles of the posterior orbit whitish. Front a little prominent, face slightly receding and a little excavated in the middle, so that the border of the mouth projects again. Antennæ rather broad, reaching down to beyond the middle of the face, with the bristle having a very short, hardly visible pubescence. Opening of the mouth very large; proboscis and palpi short. Thorax whitish-gray with a pale yellow dot at the shoulder angle, and a second immediately before the base of the wing. The short hairs of the upper side of the thorax are whitish, the bristles blackish; of the four bristles in its middle, the first pair is very near the suture. Scutellum with only two long bristles. Abdomen whitish-gray at the base, more ashy gray towards the end, with short, whitish-yellow hairs, the hind border of the last segment having black bristles. Borer shining black, flat, tapering towards the end, nearly as long as the three last abdominal segments taken together, with black hairs. Legs dark-yellow. Wings whitish hyaline before the tips, with a large radiating spot, incumbent to the costal border; this black spot includes two clear drops, one of which on the costal border immediately behind the tip of the second longitudinal vein, the second between the two transverse veins at the anterior side of the fourth longitudinal vein. The first ray runs from the anterior end of the small transverse vein to the stigma, in which it vanishes; the second is shorter and reaches the costal border between the tip of the first longitudinal vein and the black spot itself; the third and fourth rays run to the tip of the wing, reaching it at the tips of the third and fourth longitudinal veins; the fifth and sixth cross the second posterior cell; the seventh includes the posterior transverse vein and reaches the posterior border of the wing, whereas the eighth reaches only to the fifth longitudinal vein. The small transverse vein lies outside of the black spot; yet in its whole neighborhood the surface of the wing is brownish, and a small gray spot lies immediately before it. Transverse veins approximated, perpendicular; the small transverse vein rather far beyond the tip of the first longitudinal vein.

Hab. Georgia. (Osten-Sacken.)

19. T. aequalis Loew. ♂. (Tab. II, fig. 20.)—Flava, unicolor, alis æqualiter fusco-reticulatis, guttis hyalinis plerisque majoribus.

Yellow, unicolored, with the brown reticulation of the wings very uniform and most of the limpid drops of considerable size. Long. corp. 0.22—0.23. Long. al. 0.23.

Totally yellow, also the hairs and bristles, only the anterior frontal bristles and those at the hind border of the last abdominal segment being brownish. Front rather broad and short. Face descending nearly straight, excavated a little above; the border of the mouth not projecting. Antennæ yellow, slightly descending beyond the middle of the face, third joint rather narrow, bristle with an extremely short, hardly visible pubescence. Opening of the mouth small, a little prolonged anteriorly, so that its form is almost triangular. Proboscis and palpi of middle size. The first pair of the bristles inserted in the middle of the thorax, is very near the transverse suture. Scutellum with four bristles. Legs a little more slender than usual, tarsi longer; anterior femora rather thick, with remarkable, pale yellowish bristles on the under side. Wings of rather equal breadth, hyaline with a brownish reticulation of unusual uniformity. Most of the drops forming it are rather large; those on the costal border are more oblong, and separated by short blackish-brown rays; the color of the reticulation near the border of the wings is considerably darker than in the middle of the wing. The small transverse vein lies far beyond the tip of the first longitudinal vein, and a little beyond the third fourth of the discal cell; the posterior transverse vein is a little oblique.

Hab. Illinois. (Kennicott.)

20. T. festiva Loew. ♂ and ♀. (Tab. II, fig. 21.)—Flava, unicolor, terebrâ fœminæ valde elongatâ fuscâ, alis hyalinis inæqualiter reticulatis, in apice radiatis, picturâ in basi et disco flavescente, prope marginem anticum et in triente alarum apicali nigro-fuscâ.

Yellow, unicolored; the borer of the female brown and very prolonged; reticulation of the wings unequal, radiated in the apex, yellowish at the base and in the disk, dark fuscous near the borders and on the apical third of the wing. Long. corp. ♂ 0.17—0.18, ♀ 0.20—0.23. Long. al. 0.22.

Rather bright yellow; hairs and bristles almost all of the same color, only the anterior frontal bristles as well as the bristles of the hind border of the last abdominal segment brownish, and the short hairs in the middle of the abdomen mostly blackish. Front of middle breadth. Face rather narrow, descending almost perpendicularly, slightly excavated; border of the mouth not prominent. Antennæ yellow, reaching a little beyond the middle of the face; the third joint not broad, with the bristle having a very short, hardly visible pubescence. Opening of the mouth rather large, raised a little anteriorly. Proboscis and palpi of middle size. Cheeks descending a little beneath the eyes. The foremost of the two pairs of bristles inserted in the middle of the thorax is close by the transverse suture. Scutellum with four bristles. Abdomen sometimes brownish-tawny, leaving the hind borders of the segments paler; this color seems to result from desiccation, since in some individuals the abdomen is uniformly yellow. The borer is conical, narrow, not flattened, nearly as long as the four last abdominal segments taken together, blackish-brown in well-colored individuals, red with black extremity in more recent individuals. Wings hyaline, the reticulation being blackish-brown, paler and yellowish-brown near the base and in the middle of the wing. In the middle of the wing there are only a few drops of considerable size, four of which are remarkable for their regular position and a more whitish appearance; one of these drops is above, the second before, the third behind the small transverse vein, the fourth in the discal cell nearly before the posterior transverse vein. The reticulation sends the following blackish-brown rays to the border of the wing: 1. A narrow one to the middle of the exterior costal cell; 2. A narrow one to the tip of the auxiliary vein; 3. A broader one, the end of which is sometimes separated as a spot, to the middle of the stigma, and another being sometimes confluent with it, to the end of the first longitudinal vein; 4. A narrow one rising from the first of the four drops enumerated above; 5. A very broad one reaching the border of the wing between the foregoing ray and the tip of the second longitudinal vein; 6. A ray running to the tip of the second longitudinal vein; 7. A ray ending between the tips of the second and third longitudinal veins; 8 and 9. Two rays running to the tips of the third and fourth longitudinal veins; 10 and 11. Two rays crossing the second posterior cell, the second of which joins the reticulation, which is formed by a few large drops, and fills the hind part of the wing as far as the axillary incision. Small transverse vein a little inclined exteriorly, placed at the end of the second third of the discal cell; posterior transverse vein steep.

Hab. Pennsylvania. (Osten-Sacken.)

21. T. bella Loew. ♂ and ♀. (Tab. II, fig. 23.)—Flavo-cinerea, capite, pedibus abdomineque luteis, hoc apicem versus nigricante, alis nigro-reticulatis, in apice radiatis, guttis disci paucissimis, pone venulam transversam nullâ.

Yellowish gray; head, legs, and abdomen yellow, the latter blackened towards the end; reticulation of the wings radiating at the apex, black, with very few drops in the middle; no drops at all beyond the small transverse vein. Long. corp. ♂ 0.12—0.13. ♀ 0.13—0.15. Long. al. 0.11—0.12.

Head rather pale yellow, front and antennæ sometimes darker, the former being of middle breadth, slightly narrowed anteriorly. Face rather narrow, nearly perpendicular, slightly excavated, the anterior border of the mouth again projecting a little. Antennæ yellow, reaching to nearly the border of the mouth; the third joint somewhat broad, with the bristle having an extremely short, hardly visible pubescence. Opening of the mouth very large, a little raised anteriorly. Proboscis and palpi rather large. Cheeks descending a little beneath the eyes. Thorax yellowish-gray. Scutellum of the same color, pale yellow at the tip, to a larger or smaller extent, with four bristles. Metanotum black, but dark gray from its being dusted with paler. Abdomen dark yellow, black towards the extremity; well preserved specimens show distinctly that this black color is produced by each of the last segments having two large blackish spots, which leave an intermediate streak, and the posterior border yellow; in most specimens these black spots are not distinct, or only the hind borders of the last segments are paler. Borer black, rather broad, narrower towards the end, flat, little longer than the two last segments taken together. Legs yellow. Hairs of the whole body and all bristles yellowish, only the very short hairs of the borer being black. The reticulation of the wings is blackish-brown, leaving only the innermost base of the wing free, with the exception that it has some blackish spots. In the middle of the wing there are so few clear drops, that the black color is not only continuous, but also occupies most part of the surface; in the sub-marginal cell there is only one clear drop, near the hind side of the second longitudinal vein and a little beyond the small transverse vein. Between the third and fourth longitudinal veins there is only a single clear drop on the anterior side of the antepenultimate portion of the fourth longitudinal vein. The want of that drop which is usually inside of the said interval beyond the small transverse vein, is very characteristic of this species, as is also the considerable depth and blacker color of the convexity existing there. In the discal cell there is always one drop on the hind side of the penultimate portion of the fourth longitudinal vein, and one or more such drops on the anterior side of the fifth longitudinal vein. The third posterior cell and the axillary angle of the wing have a reticulation produced by a few, proportionately large, hyaline drops. The reticulation of the wings emits ten rays to the borders, corresponding to those of *Tryp. festiva*, except that the first ray of the latter species is wanting totally in *Tryp. bella*, and the two rays described under No. 3 in *Tryp. festiva* are reunited into one single ray in *Tryp. bella;* the last ray in *Tryp. bella* is usually connected again with the remaining reticulation; in this case the second posterior cell also contains a separated clear drop. Posterior transverse vein not quite perpendicular.

Hab. Washington. (Osten-Sacken). New York. (Dr. Fitch.)

Observation.—Among the specimens forwarded by Baron Osten-Sacken there was one bearing the name of *Acinia bella* Fitch. I have therefore adopted this name for this fine new species.

Note.—Very common on *Ambrosia artemisiæfolia.*—O. S.

22. T. latifrons Loew. ♀. (Tab. II, fig. 22.)—Obscura, capite, tibiis tarsisque flavescentibus, fronte latissimâ, scutello convexo biseto, alis latiusculis, parce et satis æqualiter nigro-fusco reticulatis et in apice breviter radiatis, bullâ cellulæ posterioris primæ permagnâ.

Obscure; head, tibiæ, and tarsi yellowish; front very broad; scutellum very convex, with two bristles; wings rather broad, with the blackish reticulation rather uniform, but little crowded, and emitting short rays at the tip; the first posterior cell with a very large convexity. Long. corp. 0.30. Long. al. 0.27.

The single specimen of this species which I have seen being oily, I can say nothing certain about the color of its body. On the upper side of the thorax there is a broad, simple intermediate stripe, and on each side a bipartite lateral one, moreover a darker streak above the base of the wing. Metanotum black, shining. The last abdominal segment shining blackish-brown. Head yellowish; front exceedingly broad; frontal bristles black; on the lateral border there are only two, bent anteriorly. Face perpendicular, deeply excavated in the middle, gradually projecting again below. Antennæ yellowish, short, very broad, the third joint having a distinct, though not sharp anterior corner, the bristle with an exceedingly short pubescence. Cheeks rather broad. Opening of the mouth large; proboscis short; palpi very broad and projecting much over the border of the mouth. The short hairs of the thorax are whitish-yellow, the bristles black; the anterior one of the two pairs of bristles inserted in the middle of the thorax is very near to the suture. Scutellum very convex, with only two bristles. Borer shining black, a little longer than the three last abdominal segments taken together, conical, not flattened at all, a little inflated at the basal half. Femora almost black at the base, further on brown, yellow at the tip; tarsi and tibiæ yellow, the latter brownish-yellow towards the base. Wings rather broad, covered entirely with a black reticulation; the drops in it are more numerous, larger, and hyaline on the borders of the wings, much more scarce, smaller, and mostly yellowish-brown in their middle. There are eight short, blackish-brown rays on the portion of the costal border lying beyond the tip of the first longitudinal vein and at the tip of the wing. Between the third and fourth longitudinal veins there is only a single hyaline drop before the small transverse vein. Transverse veins perpendicular; the convexity of the first posterior cell very large and deep, rendering thereby its surroundings rather uneven.

Hab. Carolina. (Zimmermann.)

23. T. melanogastra Loew. ♂ and ♀. (Tab. II, fig. 23.)—Flavo-cinerea, abdomine nigro, capite pedibusque flavis, alis hyalinis, nigro-reticulatis et in apice breviter radiatis, guttis disci paucissimis, bullâ cellulæ posterioris primæ minimâ, scutello biseto.

Yellowish-gray; abdomen black, head and legs yellow; wings hyaline with a black reticulation, short apical rays, few discal limpid drops, and a small convexity in the first posterior cell; scutellum with two bristles. Long. corp. ♂ 0.09—♀ 0.12. Long. al. 0.12.

Yellowish-gray, with a black abdomen. Head yellow; front bright yellow, of middle breadth; frontal bristles brown, but appearing yellow in a reflected light. Face rather narrow, descending straight, excavated in the middle, gradually projecting again beneath. Antennæ yellowish, rather broad, with the third joint having a distinct anterior corner, and the bristle with a short, hardly visible pubescence. Eyes almost round. Cheeks narrow. Opening of the mouth large; proboscis and palpi short. The short hairs of the thorax pale yellowish, the bristles brownish; the first of the two pairs of bristles in the middle of the thorax very near the transverse suture. Scutellum of the color of the thorax, but usually yellow at the tip, with two bristles. Abdomen and metanotum black, rather glossy; the short and scattered hairs of the former pale yellowish. Borer flat, shining black, nearly as long as the abdomen. Legs yellow. Wings hyaline, with the reticulation blackish and a little interrupted, leaving only the innermost base of the wing free. The following hyaline spots produce the reticulation on the borders of the wing: one before the tip of the auxiliary vein; two between the tips of the first and second longitudinal veins, and sometimes a drop immediately before the tip of the second longitudinal vein, five oblong incisions limiting the four rays emitted to the tip of the wing; a clear drop touching the border beyond the tip of the first longitudinal vein, often confluent with a drop lying immediately above it, and forming thereby an incision; three drops between the tips of the fifth and sixth longitudinal veins, the intermediate of which is the largest; a drop immediately before the tip of the sixth longitudinal vein, and one in the axillary angle. On the middle of the wing there are the following rather large clear drops: one on the hind side of the second longitudinal vein, a little beyond the small transverse vein; the others on the anterior side of the fourth longitudinal vein, one being before, the other behind the small transverse vein; one on the anterior side of the fifth longitudinal vein, and a little before the small transverse vein, having sometimes a small drop on each side; a very large drop in the middle of the third posterior cell, and a very minute one at the innermost base of this cell.

Hab. Cuba. (Poey.)

APPENDIX I.

I give here as an appendix a translation of Wiedemann's descriptions of four species, which I have formerly seen, but have not before me at present.

1. T. lichtensteinii Wied. (Auss. Zweifl. II, 497, 31.) ♂. (Tab. II, fig. 25.)

Clay-colored; wings with the tip, a square spot on the hind border, an oblique band and some dots, brown. Long. corp. 0.2.

Front and antennæ rather bright yellow, all the other parts more or less honey-yellow, turning to clay color on the thorax. The fuscous color of the apex of the wing extends farther along the anterior than on the posterior border, and forms a little tooth on the fourth longitudinal vein; a large square fuscous spot is situated on the hind border, and includes the posterior transverse vein. Between this spot and the brown apex there is a triangular almost hyaline space, having a very limpid drop in each corner, and including a small fuscous spot on the hind border of the wing. The anterior corner of the square fuscous spot is connected with the stigma by an oblique fuscous band, including the small transverse vein; there are besides a small fuscous dot above the fifth longitudinal vein, and another slightly larger below this vein, and also a brown margin of the small basal transverse veins; some pure limpid drops of a rather large size are seen near the borders of the larger brown spots.

Hab. Mexico.

Observation.—The bristle of the antennæ is thickened near the base in a striking and peculiar manner. In each of the sinuses of the large hyaline spots of the wing there is a large whitish drop, not a clear one, as Wiedemann states.

2. T. scutellaris Wied. (Auss. Zweifl. II, 484, 13.) ♂ and ♀. (Tab. II, figs. 26, 27.)

Thorax with the lateral border spotted with black; scutellum polished, brown with a reddish stripe; abdomen marked with blackish-brown bands; wings with brown bands and spots. Long. corp. 0.26.

Antennæ pale ochreous; front isabella-colored, with the upper part gray. Middle of the thorax grayish, with two darker stripes and some little dots. Scutellum polished, with the lateral borders dark brown and the middle reddish. Abdomen very pale gray at the base, with a fuscous band, a little interrupted in its middle; the third, fourth, and fifth abdominal segments each with a similar band at the base, but more interrupted in the middle and attenuated towards the sides. Ovipositor broad, red on each side of the base, the remainder gray, with the tip fuscous. Wings with a brown band running over the basal transverse veins, but not attaining the posterior border; and with a complete band before the middle transverse vein, emitting another oblique band which crosses the two transverse veins and runs to the posterior border. Tip of the wing brown. The costal portion of the space, included by the second band and the brown of the tip, is tinged with brown on its basal half, whereas its apical half is yellow and spotted with brown before a small hyaline margin of the brown apex; one of the brown spots in the yellow half reaches the third longitudinal vein.

Hab. Mexico.

Observation.—The number and size of the black spots on the lateral border of the thorax is rather variable. In the female the abdomen has alternately gray and black bands; in the male only the two last segments of the abdomen are shining black, with the exception of the posterior borders. I am not sure whether this species is a real *Trypeta*, several characters seeming to prove that it belongs to *Ortalis*. Many years have elapsed since I have seen it; besides, at that time I was not quite certain about the true limit between the *Trypetidæ* and *Ortalidæ*.

3. T. comma Wied. (Auss. Zweifl. II, 478, 4.) ♀. (Tab. II, fig. 28.)

Of a pale brick color; thorax with yellowish hair; wings fuscous, with a limpid costal triangle, including a fuscous comma. Long. corp. 0.23.

Antennæ of a light clay color, with the third joint very short. Face of a very pale, front of a more saturated clay color. Thorax with yellowish hair. Scutellum and pleuræ brownish-red. Abdomen a little paler. Ovipositor polished, with the extremity of the tip black. Wings fuscous, with numerous lighter little dots, growing almost hyaline towards the hind border. There is beyond the middle of the costa a triangular limpid excision, including a central fuscous comma, reaching from the costa to the first longitudinal vein; the tip of the wing is, in an almost imperceptible manner, margined interruptedly with hyaline. Poisers yellow, with the knob brown. Legs reddish-ochreous, tarsi paler.

Hab. Kentucky.

Note.—Judging by the character of the picture and the venation of the wings, this species seems to have some relation to *T. solidaginis* Fitch. [I possess specimens from Maryland which answer this description, except that the abdomen is brown, and that there is an elongated hyaline spot at the tip of the sixth longitudinal vein. Macquart (Dipt. Exot. II, 3, p. 229) had evidently a similar specimen before him, and took it for *Trypeta comma*. I incline to believe that he was right.—O. S.]

4. **T. culta** Wied. (Auss. Zweifl. II, 486, 16.) ♀. (Tab. II, fig. 29.)

Pale reddish-yellow; wings brownish-yellow, marked with limpid drops and a black dot towards the tip, the borders being limpid and radiated with brownish-yellow. Long. corp. 0.3.

Antennæ brownish-yellow, with the third joint very short. Face yellowish, very polished, with three black dots. Front ochreous, on each side with a deep black dot near the antennæ. Eyes golden-green, speckled with purplish. Thorax almost brownish-yellow, with indistinct darker stripes. Scutellum polished, with two black dots at the tip. Abdomen ochreous, with bristly hairs and indistinct fuscous spots. Wings shining, clay colored on the disk, from which several clay-colored rays, margined with brown, run to the borders of the wing; on the disk there are several limpid drops encircled with black, and some brown spots appearing violet in a certain light, and farther towards the apex there is an impressed black dot; on the posterior border, towards the base, some limpid drops may be seen. The costa has two or three small bristles at the end of the auxiliary vein.

Hab. Savannah.

APPENDIX II.

In order to complete this paper on N. A. *Trypetidæ*, it has been deemed useful to reproduce the descriptions of the species of this family found in former authors, but as yet not identified by Mr. Loew. As four of the descriptions of this category are already presented by Mr. Loew in the first appendix, I give here the remaining, according to the list of species on p. 61. Four species only from Jamaica, described by Mr. Walker, have been omitted, as their descriptions, published in English, will always be easily accessible to those desirous to extend their collections to the West

Indian Islands. (These species are: *T. acidusa* Walk., List of Dipt. Brit. Mus., vol. iv. p. 1014; *T. ocresia*, ibid. p. 1016; *T. avala*, ibid. p. 1020; *T. dinia*, ibid. p. 1040.) The descriptions published in foreign languages I have translated into English; all measurements have been reduced to tenths of an inch. O. S.

5. T. fucata Fabr. (Syst. Antl. 321, 24. Ent. Syst. IV, 359, 194.)

Musca antennis setariis, cinerea, ano testaceo, alis fuscis, albo punctatis.

Hab. In Americæ meridionalis insulis. Dr. Pflag.

Corpus parvum, cinereum, ano solo testaceo; alæ fuscæ, punctis numerosissimis albis. Oculi virides.

Antennæ with a bristle, body cinerous, anus testaceous, wings brown, spotted with white. (Islands of South America.)

Body small, cinerous, the anus alone testaceous; wings brown, with numerous white dots; eyes green.

(This is taken from *Entom. Syst.*; the description in *Syst. Antl.* is still shorter.)

6. T. narytia Walk. ♂. (Walk. List. etc. IV, p. 1020.)—Fusca, cinereo tecta, capite fulvo, abdomine piceo, basi fulvo, palpis antennis, pedibusque fulvis, alis limpidis, fusco quadrifasciatis. Long. corp. 0.1. Long. al. about 0.2.

Body brown, thinly clothed with short black hairs; head and chest beset with very few black bristles; head tawny, adorned with white bloom, which occupies only the sides of the crown; sides of the face without bristles; epistoma not prominent; eyes red; forepart slightly convex, its facets a little larger than those elsewhere; sucker black, clothed with tawny hairs; palpi tawny; feelers tawny, shorter than the face; third joint downy, nearly conical, rather more than twice the length of the second, slightly angular on the upper side of the tip; bristle black, bare, tawny and stout at the base, rather more than twice the length of the third joint; chest covered with gray bloom; abdomen pitchy, shining, spindle-shaped, tawny at the base, much longer and a little narrower than the chest; legs tawny, clothed with short black hairs; claws black; wings colorless, adorned with four black bands; the first, second and fourth bands extend but little below the fore border; the third attains the hind border and includes the two cross veins; wing-ribs and veins tawny, the latter dark towards the tips, and in the dark parts of the wing; the distance between the cross-veins is less than the length of the middle cross-vein; poisers tawny.

Hab. Florida. (Mr. Doubleday.)

7. T. mevarna Walk. ♀. (Walk. List. etc. IV, p. 1023.)—Fusca, cinereo tecta, abdomine basi cinereo, apice nigro, palpis, antennis, pedibusque fulvis, alis albis apice fusco radiatis. Long. corp. 0.13. Long. alar. 0.25.

Body dark tawny, thinly clothed with tawny hairs, covered with gray bloom, which has a tawny tinge on the breast; head tawny; sides of the face without bristles; epistoma not prominent; eyes brassy, adorned with green and purple; forepart rather flat, its facets larger than those elsewhere; sucker tawny, clothed with tawny hairs; palpi tawny, beset with tawny bristles; feelers tawny, a little shorter than the face; third joint nearly linear, downy, very slightly rising on the upper side at the tip, which is truncated, full twice the length of the second joint; bristle black, tawny and rather thick at the base, rather more than twice the length of the third joint; abdomen obconical, tawny, gray at the base, black and tapering towards the tip, much longer than the chest; legs tawny, clothed with short black hairs; claws black; wings white, adorned near the tip with a large brown spot, which is darkest along the foreborder, and sends forth nine rays from its paler part; it includes two distinct white dots, and along the border are others incomplete; it has a tawny tinge above the middle cross-vein, which is separated from the lower cross-vein by very little less than the length of the latter; both are perpendicular; wing-ribs tawny; veins black, tawny towards the base; poisers tawny.

Hab. Florida. (Mr. Doubleday.)

8. T. mexicana Wied. ♂. (Auss. Zw. II, 511.)—Fuscano grisea; pedibus luteis; alis brunneis, basi guttisque maximam partem marginalibus limpidis. Long. corp. 0.09.

Antennæ reddish yellow; face paler; front of a more intense yellowish red; mesothorax brownish-gray; abdomen more blackish-gray, distinctly pubescent with yellow; bases of the wing hyaline, only with two brown streaks between the costa and the next vein; the remainder of the wing, about three-fourths of it, of a saturated brown; the anterior border with two pairs of obliquely elongated limpid drops; a somewhat larger one at the tip of the wing; eight or nine drops on the posterior border, two of which are larger than the others; three drops in a longitudinal row between the third and fourth, and several larger and smaller drops between the fourth and fifth veins; legs bright honey-yellow.

Hab. Mexico. (Berlin Museum.)

9. T. scutellata Wied. ♀. (Auss. Zw. II, 494.)—Fusca, scutello rubido; alis extremâ basi, fasciis, punctisque binis fasciâque anteapicali elutâ fuscis. Long. corp. 0.26.

Body rather slender. Head broader than the thorax. Last joint of antennæ elongated, linear. Antennæ and hypostoma somewhat reddish yellow. Front brownish-red. Body of a shade of brown which holds the middle between the color of chocolate and that of cloves. Thorax with a grayish reflection. Shoulders, scutellum and occiput somewhat pale reddish-yellow. Abdomen narrow, incisions and a longitudinal line, at least beyond the middle, somewhat whitish. Wing with two bands at the root; the anterior one is broader and somewhat curved, the posterior one is narrowed and more straight, running over the usual cross-vein; both are entire and have the middle cross-vein between them. Before the tip of the wing, which is white, there is a somewhat obsolete band; before this band is a transverse streak and still more internally, between the third and fourth vein, a brown dot. Legs brown, femora in part reddish brown.

Hab. Mexico.

10. T. marginepunctata Macq. (Hist. Nat. Dipt. II, 464. ♀. *Tephritis.*) Long. corp. 0.32.

Thorax with a grayish down; abdomen reddish fulvous; wings blackish; several white spots along the borders.

Hab. Philadelphia.

11. T. obliqua Macq. (Hist. Nat. Dipt. II, 464; Dipt. Exot. II, 3, 225. Tab. XXX, f. 11. *Tephritis.*) Long. corp. 0.23.

Yellow; metathorax with two black spots. Wings at basis, along the anterior border and three oblique transverse bands; a hyaline spot at the anterior border, brownish ferruginous.

Hab. Cuba.

Note.—The description has been translated literally, although it is not very clear, and the figure, without description, given in the Diptères Exotiques, does not seem to agree with it.—O. S.

12. T. quadrifasciata Macq. (Dipt. Exot. II, 3, 226, 7. Tab. XXX, f. 8. ♂; *Tephritis.*) Long. corp. 0.24.

Head, proboscis and antennæ ferruginous; antennal bristle tomentose; thorax brown, with a whitish down anteriorly. Abdomen brown, with brownish incisures; legs testaceous; wings brownish fulvous with four hyaline oblique bands, reaching the posterior border; the third of them touches at the same time the anterior border. The spaces between the hyaline bands are fulvous, margined with brown.

Hab. Georgia.

13. T. nigriventris Macq. ♀. (Dipt. Exot. Suppl. V, 124; *Urophora.*)—Testacea; abdomine nigro; alis fuscis, margine externo duabus maculis, interno unâ maculâ, disco duobus punctis limpidis. Long. corp. 0.25.

Proboscis, palpi, face, front and antennæ testaceous; thorax testaceous; its dorsum brownish with a slight whitish down. Abdomen black, shining; legs fulvous, the last joints of the tarsi brown; poisers yellowish-white; wings brown; two hyaline, triangular spots about the middle of the anterior border; interval between these two spots yellow; a similar spot on the posterior border, nearer to the tip; two small, oblong spots, likewise hyaline, about the middle of the disk; neuration normal.

Hab. Baltimore.

14. T. beauvoisii Rob. Desv. (Myodaires, etc., p. 760. *Prionella.*) Length 0.32.

Antennæ and front yellowish; face whitish; thorax brownish-gray on the back, pale fulvous on the sides; abdomen whitish, annulated with reddish-black, with the last segment reddish; legs pale fulvous; wings hyaline with four reddish-brown fasciæ.

This species was contained in Palisot de Beauvois's collection, and probably comes from the United States.

15. T. villosa Rob. Desv. (Ibid. *Prionella.*)

This species, the antennal bristle of which is hairy, has the body, the front, the legs and the antennæ yellow; the back of the thorax shows interrupted, shining black lines; two transverse whitish lines on the abdomen, the last segment of which is black; wings hyaline with four flavescent fasciæ.

Patria like the preceding.

16. T. asteris Harris. (Treatise, etc., 2d edit. p. 498, 3d edit. p. 620.) Long. corp. 0.2.

Of a light yellowish-brown color, with paler legs; wings broad, rounded at the tip and clouded with brown in large spots, forming three wide, irregular bands across them. (New England; produces swellings, as large as a walnut on the stems of the native asters or starworts.)

APPENDIX III.

The manuscript of Mr. Loew was already prepared, when he received from me four *Trypetæ* not described in it. The first is a species of Say; the three others have been published by Mr. Loew since, in the *Berliner Entomologische Zeitschrift.* I reproduce here the description of *T. obliqua* Say, as well as those of the other species, the latter in English translation, as they appeared in Latin. O. S.

17. T. obliqua Say. ♂ and ♀. (*Say*, Journ. Acad. Phil. VI, p. 186.)—Flava, alæ fasciis obliquis flavis, fusco-marginatis, abdomen seriebus duabus punctorum nigrorum.

Yellowish, wings with oblique yellow bands, margined with brown; abdomen with two series of black dots. Long. corp. 0.1—0.13.

Body pale brownish-yellow; wings with a definite yellowish costal border, and three very oblique bands proceeding from the costal border; basal band terminating on the posterior border midway between the fifth and sixth longitudinal veins; middle band terminating at the tip of the fifth vein; outer band terminating at the tip of the fourth vein; yellow margin of the costal border ending a little beyond the third vein; the bands are edged exteriorly with a black line, which is dilated into a spot at tip; thorax with two black dots behind; scutel yellow, pale; abdomen with a series of black dots each side. The wing-bands are parallel and equidistant, the intervals are as broad as the bands.

Hab. Indiana. (Say.) Pennsylvania. (Osten-Sacken, on *Vernonia*, in August.)

Note.—The above description, which is Say's, will be sufficient for the recognition of the species. I have modified the terminology to make it agree with that used in this publication, and will only add that the third longitudinal vein bears some black bristles, that both cross-veins are oblique, that the posterior portion of the fourth vein is distinctly arcuated at its base, and that the tip of the wing has a peculiar whitish reflection.

O. S.

18. T. alba Loew. ♂ and ♀. (Loew, Berl. Entom. Zeitschr. 1861, p. 345.)—Albida, alis concoloribus immaculatis, fronte, pleuris, scutello, segmentorumque abdominalium singulorum margine postico pallide sulphureis, facie cum antennis, pedibus et terebrâ obscurius flavis.

Whitish, wings whitish, without spots, front, pleuræ, scutellum and the posterior border of the abdominal segments pale sulphur-yellow; face, antennæ, legs and borer of the ♀ darker yellow. Long. corp. 0.13—0.17. Long. al. 0.15—0.16.

Antennæ of moderate length; tip of the third joint round, bristles with a very short pubescence. Eyes large, almost round; cheeks moderate. Oral opening moderate, rounded, proboscis not geniculated, palpi short. Scutellum flat, with four bristles. Borer of the ♀ flattened, ferruginous-yellow, longer than the three last segments of the abdomen taken together. Wings whitish, all the veins very pale, and, except the first longitudinal one, bare; posterior angle of the anal cell acute.

Hab. Pennsylvania. (Osten-Sacken; taken on *Vernonia novæboracensis*, iron weed, together with the two following species, and with *T. obliqua* Say; in August.)

19. T. albidipennis Loew. ♂ and ♀. (Loew, Berl. Entom. Zeitschr. 1861, p. 345.)—Nigro-cinerea, thoracis dorso albicante, capite, thoracis vittâ laterali scutelloque sulphureis, alarum albidarum stigmate fusco, terebrâ fœminæ atrâ.

Blackish cinereous, thorax more whitish above, head, a lateral stripe on the thorax, and the scutellum sulphur-yellow, wings whitish, stigma fuscous, borer of ♀ black. Long. corp. 0.17—0.20. Long. al. 0.18—0.19.

Antennæ moderate, ferruginous-yellow, tip of the third joint rounded, bristle almost bare. Eyes large, almost round; cheeks moderate; proboscis not geniculated, palpi short. Thorax dusted with whitish above, with a short, whitish pubescence and black bristles; scutellum with four bristles. Abdomen with black hair. Borer of ♀ flattened, black, with black hair; a little longer than the three last joints of the abdomen taken together. Feet brownish-black, trochanters, knees, tip of the tibiæ and the tarsi yellowish ferruginous. Wings whitish, stigma brown, all the veins, except the first longitudinal one, bare, pale yellow on the basal part of the wing, brown beyond it.

Hab. Pennsylvania. (Osten-Sacken, on *Vernonia*, in August.)

20. T. vernoniæ Loew. ♂ and ♀. (Loew, Berl. Entom. Zeitsch. 1861, p. 346.)—Helva, metanoto nigro, capite, thoracis vittâ laterali, superiore pleurarum parte et scutello pallidius, antennis, terebrâ, pedibusque obscurius flavis; alarum dimidio apicali fasciis tribus fuscis subreticulato, primâ incompletâ et obsoletiore, secundâ integrâ, tertiâ postice abbreviatâ.

Pale yellowish, metanotum black, head, lateral stripe of the thorax, upper part of the pleuræ and scutellum pale yellow, antennæ, borer and legs darker yellow; apical half of the wing subreticulated with three brown bands, the first of which incomplete and less apparent, the second entire, the third abbreviated posteriorly. Long. corp. 0.18—0.22. Long. al. 0.17—0.18.

Head yellow, orbit of the eyes narrow, with a silvery reflection. Antennæ ochreous, third joint oblong, bristle almost bare. Oral opening rather large, rounded, proboscis not geniculated, palpi moderate. Eyes large, oblong. Thorax above clothed with a short, whitish pubescence, and with faintly brownish bristles. Scutellum flat, with four bristles. Metanotum black, dusted with whitish. Abdomen yellowish luteous (*ex helvo luteum*), with black hairs on the lateral margin and on the last segments; remaining portion with yellow hairs. Borer of ♀ ochraceous, shining, somewhat flattened, equal to the three last abdominal segments taken together, clothed with soft, blackish hair. Legs fulvescent. Wings subhyaline, subreticulated with fuscous by means of three irregular transverse bands and some small apical spots; the first band, which is much abbreviated posteriorly, starts from the infuscated base of the stigma and runs obliquely towards the central transverse vein and frequently becomes obsolete, leaving, however, a brown cloud on the transverse vein; the second band is narrow and straight, extending from the costa to the posterior margin; the third band is unequal, abbreviated posteriorly, and coalescent with the spots on the costa. First longitudinal vein beset with bristles, the others naked.

Hab. Pennsylvania. (Osten-Sacken, on *Vernonia*, in August.)

Note.—The first of the bands on the wings terminates posteriorly in a faint brown line, running along the discal cell and parallel to the longitudinal veins; the second and third bands being more or less coalescent, the space between the second and the tip of the wing may be described as brown, with five round, hyaline spots (one between the costa and the second longitudinal vein; the second, just below the first, between the latter and the next vein; the third between the same veins, but nearer to the tip of the wing; the fourth on the fourth longitudinal vein, just behind the posterior transverse vein; the fifth and largest at the tip of the wing, between the third and fourth longitudinal veins); second posterior cell hyaline, except a margin along the veins, which is clouded. The brown is more or less intense in different specimens, and hence the hyaline spots, especially the posterior ones, are sometimes less apparent.—O. S.

III.

ON THE NORTH AMERICAN SCIOMYZIDÆ.

The family *Sciomyzidæ* is principally based on the three genera: *Sciomyza* Fall., *Tetanocera* Dum. and *Sepedon* Latr., all occurring in North America, and on the genus *Thecomyia* Perty.

The attempt to subdivide the second of these genera has been made in various ways, but without success. I omit, therefore, to mention the genera thus formed, especially on account of the scantiness of my materials.

Sciomyza has been also subdivided into smaller genera, namely: *Graphomyza* Macq., *Pelidnoptera* Rond., *Ctenulus* Rond. and *Calobaea* Zett., the last of which, differing from all the other *Sciomyzidæ* by its much smaller basal cells, may be considered as an osculant genus. Some of the species placed by *Meigen* in *Sciomyza* belong neither to that genus nor to the *Sciomyzidæ* at all.

The characters distinguishing the *Sciomyzidæ* from all the other *Acalyptera* are as follows. The anterior frontal border more or less prominent; face receding, proportionately long, with the oral border sharp; no distinct furrows for the reception of the antennæ; no vibrissæ on the oral border; the front with two bristles, one behind the other on each side before the lateral bristles of the vertex; the costal vein of the wings uninterrupted, without spine, reaching to the fourth longitudinal vein; the auxiliary vein distinctly separated from the first longitudinal vein on its whole length; the two basal cells much developed, rather large, smaller only in the osculant genus *Calobaea* Zett. The legs have short hairs and very few bristles, and are of moderate length and rather stout, but not clumsy; all the anterior legs, especially their tibiæ and tarsi, are more developed than in the allied families; all the tibiæ on their outside before the tips have a small, erect, more or less distinct bristle; the intermediate tibiæ have a certain number of stout bristles at the tip; the fore and hind tibiæ have a single weak bristle.

Synopsis of the North American genera.

1 { The third joint of the antennæ not circular. 2
The third joint of the antennæ circular. SCIOMYZA *Fall.*

2 { Antennæ only a little prolonged; front not excavated; eyes not protuberant. TETANOCERA *Dum.*
Antennæ much prolonged; front excavated; eyes protuberant. SEPEDON *Latr.*

Gen. I. SCIOMYZA Fall.

Only three N. A. species of this genus have been described, all by Mr. Walker. His description of *Sciom. antica* is made in so careless a manner that it is quite impossible to recognize it, and *Sciom. parallela* Walk. seems to be no *Sciomyza* at all. *Sciomyza nigripalpa* Walk. is certainly not among the three species known to me. The scantiness of my present material scarcely warrants my undertaking to describe the N. A. species of *Sciomyza*, but I will present what I have to say about them, in connection with the *Sciomyzidæ* generally.

There is no reason for discussing here the smaller genera separated from the old genus *Sciomyza*, or to point out the subdivisions to be made, since the three species known to me belong all to the group of the typical species of *Sciomyza.*

*Synopsis of the Species.**

1 { Wings spotted. 1 **nana** *Fall.*
Wings not spotted, the transverse veins only clouded with brown. 2

2 { The two bristles on each side of the front extant. 2 **obtusa** *Fall.*
The foremost of the lateral frontal bristles wanting. 3 **pubera**, n. sp.

1. S. nana Fall. ♂ and ♀.—Cinerea, thorace vittato, alis nigro-maculatis.

Gray, with the thorax striped, and the wings spotted with blackish. Long. corp. 0.1—0.13. Long. al. 0.11—0.14.

SYN. *Sciomyza nana* FALLEN, Sciom. 15, 12.—MEIGEN, Syst. Beschr. VI, 18, 19.—ZETTERSTEDT, Dipt. Scand. V, 2109, 18.

Quite agreeing with the European specimens. Ashy gray. Front opaque yellow, with the ocellar triangle and the lateral

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* The fourth species, added when the manuscript was already in press, is not included in this synopsis.—O. S.

stripes reaching as far as the middle of the front, yellowish-gray. Antennæ yellowish-ferruginous, usually paler at the base, with the blackish-brown bristle beset with a short pubescence. Face whitish. Upper side of the thorax with four brown longitudinal lines, the two intermediate ones approximated and confluent with their hind ends, the two lateral ones narrower and less complete. Scutellum with a broad brown middle stripe. Pleuræ brown, in the middle with a broad longitudinal stripe pollinose with yellowish, and a similar, but more indistinct longitudinal stripe more underneath. Abdomen brownish-gray, pollinose with paler on the lateral border, the posterior corners of the segments being whitish. Forelegs black, with the coxæ and the last joint of the tarsi whitish, and the extremity of the knees brownish-yellow. Middle and hind legs brownish-yellow, with the tips and upper side of the hind femora brownish black; tips of the middle and hind tibiæ black, the last joints of the middle and hind tarsi brownish. The dark color is sometimes more, sometimes less extended on the posterior legs than is described here. Wings hyaline, slightly grayish; the costal border is margined with blackish, from the tip of the first as far as the tip of the second longitudinal vein; from the end of this margin a blackish transverse band runs as far as the fourth longitudinal vein; between it and the small transverse vein there are two small blackish spots; the small transverse vein is clouded with blackish; the posterior transverse vein is a little curved and marked with a larger blackish spot at its anterior end, and a smaller at its posterior end, both of which but rarely coalesce so as to form a complete margin.

Hab. Middle States. (Osten-Sacken.)

2. S. obtusa Fall. ♂.—Fusco-cinerea, antennarum setâ plumatâ, venis alarum transversis fusco-limbatis.

Grayish-brown, the antennal bristle plumose, the transverse veins clouded with blackish-brown. Long. corp. 0.22. Long. al. 0.22.

Syn. *Sciomyza obtusa* Fallen, Sciom. 13, 4, var. a.—Meigen, Syst. Beschr. VI, 12, 6.—Zetterstedt, Dipt. Scand. V, 2099, 10.

I see no difference between the single N. A. individual I possess and that European species which is generally considered as the true *Sciomyza obtusa* Fall. But to prevent misunderstandings I must observe that there exists another species hitherto undescribed, differing from *Sciom. obtusa* Fall. by its antennæ having a shorter pectinated bristle, but otherwise resembling that species so much that it is commonly confounded with it. Grayish-brown. Front opaque yellow near its anterior border, remainder yellowish-ferruginous; the ocellar triangle and the lateral stripes reaching beyond the middle of the front are yellowish-gray. Antennæ yellowish-ferruginous, with the bristle dark brown, yellowish-brown at the base, and having black hairs of moderate length. Face yellow. Upper side of the thorax, with the exception of the lateral borders, more brownish than gray, with darker brown longitudinal lines, the two intermediate ones being darker and more distinct, the lateral ones doubled behind the suture. Scutellum flat, yellowish-brown, pollinose with grayish-yellow. Pleuræ dark brown, with a broad, more chestnut brown longitudinal stripe running from the shoulder to the base of the wing, and having underneath a hardly distinct longitudinal stripe formed by paler pollen. Legs rather dark brown, especially the anterior ones. Tips of the fore and hind tibiæ black; tarsi blackish towards the end. Wings grayish-brown, clouded with rather smoky brown near the costal border; transverse veins clouded with blackish-brown; the posterior transverse vein is slightly oblique and straight.

Hab. Illinois. (Kennicott.)

3. S. pubera, Loew. ♂—Fusco-cinerea, setâ antennarum breviter plumatâ, metatarso antico albo, venis alarum transversis fusco-limbatis.

Grayish-brown, the antennal bristle brevi-plumose, the first joint of the anterior tarsi whitish, and the transverse veins clouded with blackish-brown. Long. corp. 0.21. Long. al. 0.21.

Front opaque, sordid yellow near the anterior border, remainder more yellowish-ferruginous, with the ocellar triangle and the lateral stripes brownish-gray, the latter reaching to the middle of the front, the foremost bristle wanting. Antennæ ferruginous, bristle brown, with a short pubescence. Face pollinose with white. Upper side of the thorax grayish-brown, with but little distinct darker brown longitudinal lines. Scutellum flat, a little paler than the upper side of the thorax. Pleuræ rather dark brown, pollinose with whitish, without distinct longitudinal stripes. Ground color of the abdomen almost brownish-black; on each segment there is a large triangular, not pollinose, spot, its tip reaching as far as the hind border of the segment, the remainder of the segment is covered with whitish pollen, which is much more dense on the hind border, and makes it appear quite pale, whereas on each side, near the lateral border, there is a vestige of a less pollinose, dark spot. The exterior genitals of the male are yellowish-brown. Legs almost blackish-brown, the intermediate ones, as well as all knees, part of the hind femora, and a great part of the hind tibiæ, more yellow; anterior coxæ yellowish, with a whitish reflection; first joint of the fore tarsi whitish; the following four black; the intermediate tarsi have a rather pale brownish-yellow ground color, rendered much darker by their short black hairs, their two last joints appearing brownish on the upper side; the hind tarsi are like the intermediate ones, but have the three last joints blackish. Wings grayish-hyaline, with the transverse veins margined with blackish, the posterior transverse vein straight and quite perpendicular. Besides the want of the foremost lateral bristle on the front, this species is distinguished from the other species of *Sciomyza* by its abdomen having the black hairs denser, longer, and finer than those.

Hab. Middle States. (Osten-Sacken.)

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4. S. luctifera Loew. ʒ. (Translated from Berl. Entom. Zeitschr. 1861, p. 345, by Bar. O. Sacken.)—Nigra, thorace cinereo, facie albâ, antennis et fronte fulvis, coxis anticis albis, pedibus nigris, tarsis posterioribus sordide albis, alis nigricantibus, margine costali nigro-limbato.

Black, thorax cinereous, face white, antennæ and front fulvous, fore coxæ white, feet black, posterior tarsi of a dirty whitish, wings tinged with blackish, costal border margined with black. Long. corp. 0.13. Long. al. 0.1.

Small, black. Face, cheeks, and the inferior part of the occiput, white. Antennæ and front fulvous, lateral stripes of the latter abbreviated anteriorly; ocellar triangle and the upper part of the occiput cinereous. Thorax dark cinereous, with black hair. Fore legs black, their coxæ white, with a silvery reflection; posterior feet black, trochanters and tarsi dirty whitish, their apex black. Wings of moderate size, tinged with blackish, with a rather broad black margin near the costa.

Hab. Pennsylvania. (Osten-Sacken.)

Note.—In younger specimens, the black color of the intermediate pair of feet is more or less brownish.

Gen. II. TETANOCERA Dum.

Among the recorded N. A. species of *Tetanocera*, *Tet. boscii* has been characterized so insufficiently by Rob. Desvoidy, that there is no possibility of identifying it. *Tet. canadensis*, described by Macquart, is also unknown to me. *Tet. guttularis* Wied. is mentioned by Macquart as a native of North America; but I must consider this statement as a mistake, since the characters he gives do not agree with the description of *Tet. guttularis* Wied.; but what species he has taken for *Tet. guttularis* has not as yet been made out. As to the other described species, the following paper will give all the necessary information:—

*Synopsis of the Species.**

1	Wings reticulated.	2
	Wings not reticulated.	11
2	Bristle of the antennæ plumose with black.	3
	Bristle of the antennæ plumose with white.	6
3	Front with three shining stripes.	4
	Front without shining stripes.	5
4	Posterior transverse vein oblique and curved.	1 **clara**, n. sp.
	Posterior transverse vein almost perpendicular and straight.	2 **valida**, n. sp.
5	Femora spotted.	3 **pictipes** *Loew.*
	Femora quite unspotted.	4 **pallida** *Loew.*
6	Thorax without stripes.	7
	Thorax with stripes.	8
7	Femora entirely yellow.	5 **flavescens** *Loew.*
	Femora very brownish at the base.	6 **arcuata** *Loew.*
8	The brown margin of the costal border of the wings interrupted by clear spots.	9
	Costal border of the wings with an uninterrupted brown margin.	10
9	The reticulation of the wings shows double bands consisting of spots arranged by pairs.	7 **combinata** *Loew.*
	The reticulation forms no double bands at all.	8 **sparsa**, n. sp.
10	Posterior transverse vein straight.	9 **costalis**, n. sp.
	Posterior transverse vein much curved.	10 **saratogensis** *Fitch.*
11	Posterior transverse vein curved and rather steep.	11 **plebeja**, n. sp.
	Posterior transverse vein curved in the shape of an S, and very oblique.	12 **plumosa** *Loew.*

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* The two species (Nos. 13 and 14), added when the manuscript was already in press, are not included in this synopsis.—O. S.

1. T. clara Loew. ♀.—Seta antennarum nigro-plumosa; vittæ in fronte lævigatæ tres; alæ parce et grosse reticulatæ, venâ transversâ posteriore obliquâ.

Bristle of the antennæ plumose with black, front with three shining stripes, reticulation of the wings sparse and coarse, posterior transverse vein oblique. Long. corp. 0.32. Long. al. 0.32.

A beautiful large species. Pale yellow. Face white, not much receding. Palpi and proboscis whitish-yellow. Front rather dark ochreous, with three very shining longitudinal stripes; the middle one distinctly widened towards its anterior end, the lateral ones near the borders of the eyes and reaching only very little beyond the foremost frontal bristle, hence not much transgressing the middle of the front. Antennæ ochreous, the two first joints short, beset with black hair, the third a little longer than the two first taken together, moderately broad and only moderately pointed; the black bristle with dense, very long, black hairs. Neither the lateral borders of the front, nor the yellow occiput have black spots. Thorax yellowish, with two brownish middle stripes separated by a broad line, and on each side with a more indistinct and less complete lateral stripe. Scutellum with brownish middle and yellowish borders. Pleuræ whitish-yellow, with a narrow brown longitudinal stripe on their superior border. Abdomen without distinct markings. Legs whitish-yellow, the end of the tarsi only a little blackish; posterior femora with a short, not very close pubescence on their under side, and only one or two longer black bristles on the second third. Wings large and rather broad, somewhat tinged with tawny; the whole stigma and the broad clouds of the small and of the posterior transverse veins brownish-black; also the tip of the wing margined with brownish-black; before the second longitudinal vein there are some small, rather indistinct, brownish-black spots, and about four or six larger and darker transverse spots between the second and third longitudinal veins, running from vein to vein, the last of which are most distinct, and include small rudiments of veins rising from the second longitudinal vein; between the third and fourth longitudinal veins there are, beyond the small transverse vein, two or three brownish-black transverse streaks running from vein to vein; on the posterior side of the fourth longitudinal vein there are only two very small brownish-black spots, one before, the other behind the small transverse vein, which, I suppose, are not always present. The remainder of the wings is unspotted. The posterior transverse vein is oblique and moderately curved.

Hab. Trenton Falls, N. Y. (Osten-Sacken.)

2. T. valida Loew. ♀.—Seta antennarum nigro-plumosa; vittæ frontales tres lævigatæ; alæ parce et grosse reticulatæ, venâ transversâ posteriore perpendiculari.

Bristle of the antennæ plumose with black, front with three shining stripes, reticulation of the wings sparse and coarse; posterior transverse vein almost perpendicular. Long. corp. 0.29. Long. al. 0.29.

Pale yellow. Face yellowish-white, only moderately receding; palpi and proboscis whitish-yellow. Front orange-yellow, with three very bright longitudinal stripes; the middle stripe not distinctly widened towards its anterior end, the lateral ones reaching a little beyond the foremost frontal bristle, which is inserted rather lower than in the preceding species, so that the lateral stripes reach a little nearer to the anterior border of the front. Antennæ ochreous, having the two first joints short, with black hairs; the third a little longer than the two first taken together, moderately broad and only a little pointed; the bristle of the antennæ with dense, very long, black hairs. There are no black spots on the lateral border of the front, nor on the yellow occiput. Thorax yellowish, with indistinct brownish longitudinal stripes. Pleuræ whitish-yellow, with a narrow brown longitudinal stripe on their superior border. Abdomen without distinct markings. Legs whitish-yellow, with the tips of the tarsi a little blackish; posterior femora with short, not very dense hairs on the under side and only two longer bristles on the second third. Wings proportionately a little smaller than in the foregoing species, somewhat tinged with tawny. The stigma, smaller than in the foregoing species, is brownish-black; the transverse veins and the tip of the wings are clouded with brownish-black; before the second longitudinal vein there are six or eight small but distinct brownish-black spots; between the second and third longitudinal veins there are four or five darker ones running from vein to vein, the last of which are more distinct; between the third and fourth longitudinal veins there are, behind the small transverse vein, four or five brownish-black transverse streaks; at the posterior side of the fourth longitudinal vein there are two rather large brownish-black spots, one before, the other, larger one behind the posterior transverse vein; on the anterior and posterior sides of the fifth longitudinal vein there are some small brownish-black alternating spots; the remainder of the wing is unspotted; the posterior transverse vein straight and rather perpendicular.

Observation.—Although this species is very similar to the foregoing, and I have only a single individual before me, its specific distinctness seems to be beyond doubt. The straight and rather steep posterior transverse vein, the lateral frontal stripes reaching farther forwards and the middle frontal stripe not being dilated anteriorly afford the best characters for distinguishing *Tet. valida* from *Tet. clara.*

3. T. pictipes Loew. ♂ and ♀.—Seta antennarum nigro-plumosa; vittæ frontales lævigatæ nullæ; alæ confertim guttato-reticulatæ; femora maculata.

Bristle of the antennæ plumose with black, front without shining stripes; wings densely reticulated with confluent fuscous spots and limpid drops, femora spotted. Long. corp. 0.24—0.26. Long. al. 0.23—0.26.

Syn. *Tetanocera pictipes* Loew, Wien. Ent. Monatsch. III, 292.

Front almost more pale brownish than yellow, opaque, beset, on its anterior part, with sparse short black hair, rising from hardly visible dark dots; hardly a trace of an excavated middle stripe; all that gloss which other species possess is totally wanting, and only a fine whitish dusted longitudinal line is visible. Each side of the front near the border of the eye a brownish-black dot, and more forwards between the antennæ and the anterior corner of the eye another small brown or blackish-brown spot. The face is silvery white, and recedes only moderately; its middle is marked with a very small black spot; on the cheeks there is a brown or blackish-brown longitudinal streak. The first and second joints of the antennæ are yellowish-brown; the third is more yellowish-ferruginous, scarcely longer than the second, not much pointed, its upper side being distinctly excised; the black bristle has a brownish-yellow base, and a scanty, rather long black pubescence; some individuals differ by the color of the antennæ being quite ferruginous brown. The upperside of the thorax is quite opaque, brownish cinereous, closely covered with small dark brown dots, which coalesce to larger spots, forming four rows, and having a rather variable size. Scutellum gray, in the middle brown, with small dark brown dots, on the borders with four black dots bearing the ordinary bristles, the hindmost of which are far longer than the others. The ground color of the abdomen is more blackish than that of the thorax, the posterior and the lateral borders of the segments being usually more brown; besides, the abdomen is covered with a rather light dust and beset with small brown dots coalescing near the lateral border into a row of obsolete spots, and in the middle of each segment into a longitudinal spot, so that a dark middle stripe, interrupted by the incisions, is formed. The sixth segment, being clavate in the male, has a large blackish-brown spot on each side, leaving in the middle a grayish or whitish mark, resembling, as it were, a cup. The ground color of the femora is little visible, being covered with light dust and speckled with black dots; immediately before the tip they are surrounded with an almost black more or less visible ring, and an almost concolorous spot before this ring on the under side. The tibiæ are yellowish-brown, with the tips blackish; the tarsi have the same color as the tibiæ, but are generally a little paler; usually the anterior ones have the three last joints, and sometimes a great part of the first, blackened, whereas in the remaining tarsi only the two last joints, or even the last alone, is blackish. The wings are more guttated than reticulated; the color of the posterior part is more gray; immediately along the longitudinal veins, and in the neighborhood of the costa, it is much darker and almost brown. The largest drops, the color of which is almost white, are scattered over the posterior part of the wing; on the anterior part they are placed near the longitudinal veins; on the costa, between the tips of the first and second longitudinal veins, there are only three small clear quadrangular spots.

Hab. Washington. (Osten-Sacken.)

Observation.—A series of specimens enables me to compare this species with the closely allied European *Tet. umbrarum* Linn. The resemblance of both is so great that I cannot but suspect that they are identical. No difference of structure existing between them, the larger size and browner color of *Tet. pictipes* alone afford a constant distinguishing character. Future observations will perhaps enable us to decide whether *Tet. pictipes* is merely a climatic variety of *Tet. umbrarum* or a different species.

Note.—I possess a specimen from Great Slave Lake, H. B. T., and have seen another from Maine, both perfectly agreeing in size and color with the European specimens. Is this fact to be considered as a proof of the identity or of the diversity of *T. pictipes* and *T. umbrarum?* The answer to this question appears to me far from certain.—O. S.

4. T. pallida Loew. ♂ and ♀.—Seta antennarum nigro-plumata; vittæ frontales lævigatæ nullæ; alæ confertim guttato-reticulatæ; femora immaculata.

Bristle of the antennæ plumose with black, front without shining stripes, wings rather densely reticulated with dark spots and limpid drops, femora quite unspotted. Long. corp. 0.29. Long. al. 0.27.

Syn. *Tetanocera pallida* Loew, Wien. Ent. Monatsch. III, 294.

Yellowish-brown, opaque. Front more yellow, opaque, without black spot near the orbit, the excavated middle stripe very narrow, not glossy; between the antennæ and the anterior corner of the eyes there is a small brown spot. Face white, considerably receding, excavated in its middle more than in most other species. Antennæ yellow with the third joint hardly as long as the second, its superior edge not distinctly excised, and its end very little pointed; the antennal bristle blackish, with the base only yellow, and the blackish hairs rather long, but not very close. Upper side of the thorax not punctured, with four complete brown longitudinal stripes, and on its posterior half immediately beside the lateral stripe, a fine, less distinct, brown, longitudinal line. Scutellum with a brown middle stripe. Pleuræ with a broad brown longitudinal stripe at the superior border, the remainder being everywhere whitish hoary. Abdomen unicolorous, with a blackish middle line, and on each side a brown linear stripe, all of them interrupted at the incisions. Legs yellowish, with the tips of the tarsi a little blackish. Wings somewhat yellowish towards the base with the reticulation moderately close and rather guttated, darker brownish-black at the costal and apical border; before the second longitudinal vein there are about six small clear dots, which do not reach the costal border itself; the small transverse vein is some distance before the middle of the discal cell, and the posterior transverse vein is very distinctly curved.

Hab. Middle States. (Osten-Sacken.)

5. T. flavescens Loew. ♂.—Seta antennarum albo-plumosa; thorax punctulatus; alæ confertim guttato-reticulatæ; femora tota pallide flavescentia.

Bristle of the antennæ plumose with white, thorax punctured, wings densely

reticulated with dark spots and limpid drops, femora quite yellowish. Long. corp. 0.33. Long. al. 0.26.

Syn. *Tetanocera flavescens* Loew, Stett. Ent. Zeit. VIII, 123.—Loew, Wien. Ent. Monatsch. III, 291.

Pale yellowish-brown, somewhat shaded into testaceous. Face white, rather considerably receding beneath. Antennæ yellow; the third joint, when viewed sideways, nearly as long as the broad second joint, not distinctly excised on its upper side, little pointed; the antennal bristle yellowish with close, white plumation of moderate length. Front yellow, opaque, with the excavated, polished middle stripe distinctly tapering anteriorly; on each side of the orbit there is an oblong oval black spot of rather considerable size and another more anteriorly, between the antennæ and the anterior corner of the eyes. Upper side of the thorax marked with close small brown dots and besides with four rather incomplete rows of small dark brown spots far distant from each other. Scutellum rather convex, glossy, almost blackish-brown, a little dusted with whitish near the base, and having a terminal dot formed of whitish dust. Pleuræ with a conspicuous, parallel, brownish-red longitudinal stripe at the superior border, below which they appear paler from their whitish dust. Abdomen with a dark middle line and near each lateral border a broad, brown one, all of them interrupted at the incisions; the fourth and fifth segments bear each a glossy yellowish-brown spot more distant from the border than the lateral lines. Legs brownish-yellow with the tips of the tibiæ and the whole of the tarsi appearing darker in consequence of the greater density of the black hair, whereas in reality the two last joints only of the anterior and posterior tarsi are blackened; the under side of the posterior femora is beset with very numerous short and many longer black bristles. Wings rather broad and obtuse, with the whole surface coarsely and rather uniformly reticulated, so that there are no fasciæ; some larger brown spots on the costal border, but no clearer spots on the apical border; the small transverse vein is very far from the discal cell, and the posterior transverse vein is only little curved and rather steep.

Hab. Carolina. (Zimmerman.)

Observation.—When naming this species I overlooked the fact that Rob. Desvoidy already has a *Tet. flavescens.* Consequently I should have altered the name, had I not before me a larger number of specimens of *Tet. arcuata* proving that this species is rather variable, and that therefore its distinctness from *Tet. flavescens* is not quite certain. Should the identity of both species be proved, the name of "*flavescens*" as being preoccupied must be dropped, and that of *Tet. arcuata* adopted for the species; should, however, future observations prove their distinctness, it will then be time enough to choose another name for *Tet. flavescens.*

6. T. arcuata Loew. ♂ and ♀.—Seta antennarum albo-plumosa; thorax punctulatus; alæ confertim guttato-reticulatæ; femoræ antica basim versus fusca.

Bristle of the antennæ plumose with white; thorax punctured, wings densely reticulated with dark spots and limpid drops; anterior femora brown towards the base. Long. corp. 0.18—0.3. Long. al. 0.2—0.23.

Syn. *Tetanocera arcuata* Loew, Wien. Ent. Monatsch. III, 292.

So similar to the foregoing that it is very easy to confound them, and after the detailed description which I have given of *Tet. flavescens*, it will be quite sufficient to point out the characters by which *Tet. arcuata* differs from it. It is always a little smaller, sometimes much smaller than *Tet. flavescens;* its second antennal joint, too, seems to be comparatively smaller and narrower, and the small brown spots on the upper side of the thorax beside the small dots, are distinctly smaller. The anterior femora are to a considerable extent brown at the base; their tips as well as the base of the posterior femora are not seldom very brownish; the anterior tibiæ are blackened to a certain extent, and the posterior tibiæ have this color at their very tips; the three last joints of the anterior tarsi are blackish.

Hab. Middle States. (Osten-Sacken.)

Observation.—The more specimens of *Tet. arcuata* I was able to examine, the more it appeared doubtful to me whether *Tet. flavescens* ought not to be taken merely for an exceedingly large and pale variety of *Tet. arcuata.* The only difference existing in the structure is, as it seems, the somewhat smaller breadth of the second joint of the antennæ in *Tet. arcuata;* this is a very trifling one, and perhaps only a character belonging to smaller specimens. The narrow arcuated band running over the posterior transverse vein of the wings, by which the first specimen which I received was distinguished, was either more indistinct or quite wanting in the specimens sent to me afterwards.

7. T. combinata Loew. ♀.—Seta antennarum albo-plumosa; thorax vittatus; alæ maculato-reticulatæ, maculis fascias duplicatas efficientibus, limbo marginis antici obscuro nullo.

Bristle of the antennæ plumose with white, thorax striped, wings reticulated with dark spots forming double bands, costal border without dark margin. Long. corp. 0.26. Long. al. 0.22.

Syn. *Tetanocera combinata* Loew, Wien. Ent. Monatsch. III, 295.

Reddish-brown, more acorn-colored on the abdomen. Front dark yellow with the middle stripe broad, impressed, polished, narrowed anteriorly, a small black dot being on each side near the orbit, and a second more anteriorly between the antennæ and anterior corner of the eye. The face white, not much receding, rather excavated in the middle. Antennæ yellow, third joint short, with the upper edge margined with blackish and not distinctly excised; the antennal bristle yellowish at the base, with a white plumation of moderate length. Upper side of the thorax almost brownish-ferruginous, with broad lateral borders dusted with whitish; the two longitudinal stripes in the middle are blackish and covered with dense white dust. The scutellum is of the same color as the upper side of the thorax, and has the sides dusted with whitish. The pleuræ too resemble the upper side of the thorax in their color, appearing however, with the exception of a longitudinal stripe on their superior part, of a paler shade, on account of their whitish dust. Immediately before the poisers there is a very conspicuous, rounded, brownish-black spot. The abdomen is more acorn-colored; it has a black middle stripe not sharply bordered and interrupted at the incisions, and a rather broad, polished, brownish-red stripe at some distance from each lateral border. Legs brownish-yellow, the tibiæ a little darker than the femora; the tarsi blackish towards their tip. Wings rather yellowish, having the reticulation formed by narrow, gray stripes in the middle of the intervals and by brown spots reaching from the longitudinal veins as far as these stripes; the brown spots are arranged so as to form distinct double bands running across the wing; the last of these bands is at the very tip of the wing, the penultimate runs between it and the posterior transverse vein; the antepenultimate runs over the posterior transverse vein itself; there is besides, anteriorly, the beginning of a double band before the penultimate band; the small transverse vein is a little before the middle of the discal cell; the posterior transverse vein is a little curved and rather steep.

Hab. Middle States. (Osten-Sacken.)

8. T. sparsa Loew. ♂ and ♀.—Seta antennarum albo-plumosa; thorax vittatus; alæ maculato-reticulatæ, fasciis duplicatis nullis, limbo marginis antici obscuro nullo.

Bristle of the antennæ plumose with white, thorax striped, wings reticulated with dark spots forming no double bands, costal border without dark margin. Long. corp. 0.24. Long. al. 0.22.

Yellowish-brown, opaque. Front dark yellow, with the middle stripe broad, impressed, polished, not narrowed anteriorly; a small black dot is on each side in the neighborhood of the orbit, and a second is more anteriorly between the antennæ and the anterior corner of the eye. Face white, not much receding, rather excavated in the middle. Antennæ yellow; the third joint nearly as long as the second, a little excised on the upper side, rather pointed; the bristle of the antennæ with the base yellow, its pubescence whitish. Upper side of the thorax with two brown middle stripes connected posteriorly and separated anteriorly, and not reaching the anterior border of the thorax; two broader lateral stripes are of the same color, but not so distinct. The scutellum also is of the colour of the thorax, but dusted with whitish on the sides. Pleuræ paler than the upper side of the thorax, having, towards their superior border, a brownish-red longitudinal stripe continued as far as below the poisers. The abdomen has a very indistinct, dark middle line interrupted at the incisions; on each side, at a distance from the lateral border, a brighter stripe not differing sensibly in color from the general color of the abdomen. Legs pale yellowish; tibiæ not darker than the femora; tarsi blackish towards their tips. Wings only little yellowish; the reticulation is formed by very narrow, gray stripes running in the middle of the intervals, and by brown spots reaching from the longitudinal veins as far as the stripes; the brown spots are arranged so as to form no double bands, showing only the anterior indistinct beginnings of some narrow simple bands, the number of which is three, besides the narrow margin of the tip of the wing. The small transverse vein is a little before the middle of the discal cell; the posterior transverse vein is only very little curved and rather steep.

Hab. Middle States. (Osten-Sacken.)

Observation.—*Tet. sparsa* differs too much from *Tet. combinata* in the markings of the wings to be considered as identical with it. I have, however, to remind, that they agree much more in their structure than is usual in nearly-related species of this genus, and that my opinion, formed on very scanty materials (1 ♀ of *Tet. combinata*, 1 ♂ and 1 ♀ of *Tet. sparsa*), cannot but have a very secondary weight. Nor will the difference in the markings of the thorax, however striking they may seem, solve the question, since, in somewhat immature specimens, they always appear inconstant, and are often variable even in quite mature ones.

9. T. costalis Loew. ♂.—Seta antennarum albo-plumosa; thorax vittatus; alæ grosse maculato-reticulatæ, margine antico anguste nigro-limbato, venâ transversâ posteriore perpendiculari, rectâ.

Bristle of the antennæ plumose with white, thorax striped, wings reticulated with coarse dark spots and the costal border having a narrow black margin, posterior transverse vein perpendicular and straight. Long. corp. 0.17. Long. al. 0.17.

Yellowish-brown, somewhat tinged with reddish, opaque. Front yellow, with the middle stripe broad, excavated, and polished, not tapering anteriorly; on each side near the orbit there is a small black dot, and more anteriorly a second larger one between the antennæ and the anterior corner of the eye. Antennæ yellow, with the third joint a little longer than the second, but little excised on the upper side, not much pointed. Antennal bristle with the base only yellow and covered with a close white pubescence. Face white, rather considerably receding. Upper side of the thorax dusted with whitish on the lateral borders; in the middle, there are two complete longitudinal stripes, formed of whitish dust and bordered with brownish streaks, which are not quite distinct and interrupted in the middle of the thorax. Superior part of the pleuræ with a brownish-red longitudinal stripe continued to beneath the poisers. Scutellum yellowish. Abdomen unicolorous, having no trace of darker stripes in the described specimen. Legs whitish-yellow, not distinctly blackened at the end of the tarsi; under side of the posterior femora with small short bristles. Surface of the wings a little yellowish, with the stigma and a margin of the costal border black; this margin runs from the stigma as far as the fourth longitudinal vein, being very narrow as far as the tip of the second longitudinal vein, and then broader; there are about six or seven small clear spots on the anterior side of the second longitudinal vein; the remainder of the coarse reticulation is little connected, and formed of rather sparse small blackish spots; the small transverse vein is a little before the middle of the discal cell; the posterior transverse vein is distinguished by its being perfectly straight and perpendicular.

Hab. Illinois. (Osten-Sacken.)

10. T. saratogensis Fitch. ♂ and ♀.—Seta antennarum albo-plumata; thorax vittatus; alæ confertim striato-reticulatæ margine antico late fusco-limbato, venâ transversâ posteriore flexnosâ.

Bristle of the antennæ plumose with white, thorax striped, wings striped with gray and reticulated with darker dots, costal border having a broad, blackish-brown margin, posterior transverse vein undulating. Long. corp. 0.2—0.22. Long. al. 0.18—0.20.

Syn. *Tetanocera saratogensis* Fitch, Report I, 68.—Loew, Wien. Ent. Monatsch. III, 296.

This species, which is readily distinguished from all the N. A. species known to me by the costal border of its wings having a broad blackish-brown margin reaching as far as the second longitudinal vein, has been accurately described by Dr. A. Fitch in the above quoted place. It strikingly resembles the European *Tet. pratorum* Fall. After examining a great number of specimens of the two species, I found it impossible to discover any constant difference in their structure; but the brownish-black color of the costal border of the wings as well as the spots along the longitudinal veins in all the N. A. specimens reach farther towards the base of the wing than is the case in any European one, besides, in the former, the color of the club-like male genitals is very dark, whereas in the latter it is much lighter and almost yellowish. Whether the two hoary stripes of the thorax really are more distant in *Tet. saratogensis*, as they seem to be, I dare not pronounce with certainty, since some specimens from Northern Europe approach in this respect the American ones. Moreover the space between those stripes in N. A. specimens as well as in European ones, is sometimes altogether yellow, sometimes bordered with distinct brown longitudinal lines, sometimes entirely brown.

Hab. Middle States. (Osten-Sacken.)

Mr. Loew referring to Dr. Fitch's description, without giving one of his own, I reproduce the former here.—O. S.

The head above is golden yellow with two small rusty stripes on its fore part, a black spot at base and dot each side anteriorly, almost in contact with the eye, and a second one, also black, on the anterior margin, between the eye and the antennæ. Face silvery white. Antennæ light yellow, second joint longer than broad, with fine short black bristles along its upper and under edge; third joint tinged with brown, narrow and curved, its upper side being concave, its lower side convex, and nearly parallel with the upper side, but slightly narrowed towards the apex, which is rounded; seta yellowish white, plumose. Thorax pale dull yellow, with a faint darker stripe each side of the middle, which stripes have an ash gray reflection when viewed from the front; clothed with a short black beard and a few long black bristles. Scutel ash gray with two nearly erect black bristles each side. Poisers yellowish white. Abdomen dusky, clothed with a short black beard, hind edges of the segments pale dull yellow. Legs pale yellow, with a fine black beard, and the spine-like bristles at the end of the shanks black. Wings iridescent, smoky brown on the outer and apical margins, hyaline towards the axilla, the space between divided into numerous square hyaline spots by dusky longitudinal stripes, one stripe being placed in the middle of each cell and sending short transverse branches to the veins at regular intervals; veins and veinlets black.

11. T. plebeja Loew. ♂ and ♀.—Seta antennarum nigro-plumosa; alæ non reticulatæ, venâ transversâ posteriore modice arcuatâ, subperpendiculari.

Bristle of the antennæ plumose with black, wings not reticulated, with the posterior transverse vein moderately arcuated and nearly perpendicular. Long. corp. 0.28—0.29. Long. al. 0.3.

Very allied and similar to the following species, but certainly different. Acorn-colored. Front yellow; the usual black spot near the orbit totally wanting. The excavated polished middle stripe of the front is not enlarged anteriorly; the polished lateral stripes are very broad and glossy, yet do not extend far beyond the middle of the front. Antennæ dark yellow, the third joint a little longer than the second, rather distinctly excised on its upper side; antennal bristle black with long and very close black hairs. Face considerably retreating, yellowish with white reflection. Upper side of the thorax, scutellum and pleuræ quite as in the following species. Abdomen brownish-yellow without darker middle line nor lateral stripes in the pair I have before me; but in well colored specimens they may exist. Legs as in *Tet. plumosa.* Wings brownish-yellow margined with blackish-brown on the whole of the costal border, beginning at the base of the stigma and being extended at the apex to a little beyond the tip of the fourth longitudinal vein; there are besides grayish stripes between the longitudinal veins; the transverse veins are margined with dark brownish-black; the small transverse vein is in the middle of the discal cell; the posterior transverse vein is distinctly curved, but not in the shape of an S, and has a rather steep position.

Hab. Middle States. (Osten-Sacken.)

Observation 1.—This species is very similar to the European *Tet. elata* Fabr., but differs by its posterior transverse vein, which, although more arcuated, has a steeper position, by its antennæ being a little broader and the black hair of its antennal bristle being much closer.

Observation 2.—From *Tet. plumosa* this species not only differs by the form and situation of the posterior transverse vein, but particularly by the considerable breadth of the polished lateral stripes of the front, which in *Tetanocera plumosa* are exceedingly narrow.

12. T. plumosa LOEW. ♂ and ♀.—Seta antennarum nigro-plumosa; alæ non reticulatæ, venâ transversâ posteriore biflexâ et valde obliquâ.

Bristle of the antennæ plumose with black, wings not reticulated, with the posterior transverse vein biarcuated and very oblique. Long. corp. 0.31—0.39. Long. al. 0.28—0.35.

SYN. *Tetanocera vicina* MACQUART, Dipt. exot. II, 3, 180, Tab. XXIV, fig. 7.
Tetanocera plumosa LOEW, Stett. Ent. Zeit. VIII, 201.—LOEW, Wien. Ent. Zeit. III, 296.
Tetanocera struthio WALKER, List of Dipt. IV, 1086.

A species of the relationship of *Tet. arrogans*, *elata*, etc. Acorn-colored. Front yellow, with a small brown dot instead of the ordinary lateral black spots on each orbit; the excavated polished middle stripe of the front being of middle breadth, and but little enlarged anteriorly; the polished lateral stripes very narrow and obsolete. Antennæ dark yellow; the third joint as long as the second, rather distinctly excised on its upper side; antennal bristle black with long and very close black hairs. Face rather receding, yellowish with white reflection. Upper side of the thorax with the lateral border broad, dusted with white and the three central longitudinal stripes likewise covered with whitish dust and leaving between them two complete narrow reddish-ferruginous stripes which unite on the hind border of the thorax and run over the scutellum.

Pleuræ with a narrow ferruginous longitudinal stripe on the superior border. Abdomen acorn-colored, with a darker middle stripe interrupted at the incisions. Legs brownish-yellow, tibiæ usually a little darker than the femora, tarsi blackened towards the tips. Wings brownish-yellow, margined with blackish-brown on the whole of the costal border, beginning from the base of the stigma and ending a little beyond the tip of the fourth longitudinal vein; moreover, there are usually dark gray stripes between the longitudinal veins; the transverse veins are margined with dark brownish-black; the small transverse vein is placed a little before the middle of the discal cell; the posterior transverse vein is very arcuated in the shape of an S, and has a very oblique position; in most specimens the fourth longitudinal vein has some small stumps, most of which are emitted from its inner side, each being inclosed in a dot-like brownish black cloud. Such specimens resemble very much the European *Tet. aratoria* Fabr.

Hab. Sitka. Middle States. (Osten-Sacken.)

Observation.—The name of *Tet. vicina* is preoccupied by R. Desvoidy.

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13. T. triangularis Loew. ♀. (Translated from Berlin. Entom. Zeitsch. 1861, p. 344, by B. Osten-Sacken.)—Glandicolor, thorace bilineato, frontis opacæ vittulis lateralibus lævigatis, subobsoletis, fossulâ mediâ distinctâ, non dilatata, subtriangulâ, antennarum setâ pilis longis, rarioribus, nigris plumatâ, alis lutescentibus, unicoloribus, venis transversis fusco-limbatis, posteriore subrectâ.

Acorn-colored, thorax with two lines, front opaque, its lateral stripes shining, almost obsolete, the furrow in the middle distinct, not dilated, subtriangular, antennal bristle with long, rare, black hairs, wings lutescent, unicolorous, transverse veins margined with fuscous, the posterior one almost straight. Long. corp. 0.26—0.27. Long. al. 0.27.

Occiput yellow, with a large shining-white spot. Front bright yellow, entirely opaque, the ordinary lateral stripes shining, narrow, almost obsolete; the furrow in the middle distinct, shining, not dilated, very shortened, subtriangular. Antennæ rather short, ochraceous, last joint a little longer than the two preceding taken together, ferruginous at the tip, bristle with long but rather rare, black hairs. Face shining-white, immaculate. Thorax above with two darker, very approximated, lines. Abdomen unicolored.

Legs luteous, three last joints of the fore tarsi, one of the intermediate ones, and two of the hind ones, blackish; hind femora of the male beset below with black bristles. Wings lutescent, unicolorous, fore and apical border not clouded, transverse veins margined with brown, the posterior one almost straight.

Hab. North Red River. English River. (R. Kennicott.)

Observation.—Very like *Tet. sylvatica* Meig., but still nearer allied to *Tet. unicolor* Loew, distinct from the former by the frontal furrow, which is very much abbreviated here and by the anterior margin which is not shining; from the latter, which it also exceeds in size, by the striped thorax, and the narrower and less obsolete frontal furrow.

14. T. rotundicornis LOEW. ♂ and ♀. (Translated from the Berlin. Entom. Zeitschr. 1861, p. 344, by B. Osten-Sacken.)—Ex helvo glandicolor, frontis opacæ vittulis lateralibus ordinariis sublævigatis, distinctis, fossulâ mediâ æquali usque ad anteriorem frontis marginem productâ, antennarum articulo tertio ovato, superius non exciso, setâ pilis nigris longis, sed raris plumatâ, alis lutescentibus, costæ dimidio secundo et apice anguste fuscis, venis transversis fusco-limbatis, posteriore subrectâ.

Pale yellowish acorn-colored, the ordinary lateral stripes of the opaque front rather shining, distinct, the intermediate furrow equal, extended to the anterior margin of the front, third joint of the antennæ ovate, not excised superiorly, bristle with long black, but rare, hairs, wings lutescent, the posterior half of the costa and the apex with a narrow brownish cloud, transverse veins clouded with brownish, the posterior one almost straight. Long. corp. 0.26. Long. al. 0.22—0.26.

Occiput yellow, with a heart-shaped shining-white spot. Front bright yellow, opaque, the ordinary lateral stripes shining, rather broad, the intermediate furrow shining, of equal breadth, entire. Antennæ short, ochraceous, third joint ovate, not excised superiorly, the bristle with long, black, but sparse hair. Thorax above with four darker lines, the intermediate ones entire, the lateral ones interrupted, not seldom all four obsolete. Abdomen unicolorous with a rather obscure lateral vitta, which is generally obsolete in the male. Legs luteous, last joints of the tarsi black, hind femora of the male beset below with black spines. Wings lutescent, the posterior half of the costal border with a paler, the apical border with a more saturated infuscation, transverse veins clouded with fuscous, the posterior one nearly straight and perpendicular.

Hab. North Red River. English River. (Robt. Kennicott.)

Observation.—Stumps of veins proceed sometimes from the posterior side of the fourth longitudinal vein.

Gen. III. **SEPEDON** Latr.

All the described species of the genus Sepedon agree much in their structure and are very readily and sharply distinguished from those species of *Tetanocera* which approach them in the whole structure of the body, as, for instance, *Tet. obliterata* Fall. and *gracilis* Loew. The most striking difference consists in the form of the heads with the protuberant eyes, the excavated front and in the second antennal joint being very much prolonged and attenuated. Among the four N. A. species known to me three fully agree as to these characters with the described species, but the fourth considerably differs from them by having the second antennal joint, though much prolonged, not attenuated, but broad as in the species of the genus *Tetanocera*, while its head is in every respect that of a *Sepedon*, so that, if we will not form a new genus for it, it cannot by any means be placed in *Tetanocera;* I consider it as the type of a new group of *Sepedon.*

Synopsis of the Species.

1	Second joint of the antennæ broad.	1 **fuscipennis** Loew.
	Second joint of the antennæ narrow.	2
2	Hind femora slender and very much prolonged, with a brown ring before the tip.	2 **macropus** Walk.
	Hind femora rather much thickened, with no brown ring before the tip.	3
3	Under side of the hind femora in the male with a deep excision and two teeth.	3 **armipes** Loew.
	Hind femora of both sexes simple.	4 **pusillus** Loew.

1. S. fuscipennis Loew. ♂ and ♀.—Rufo-brunneus, secundo antennarum articulo lato.

Chestnut-brown, second joint of the antennæ broad. Long. corp. 0.26—0.27. Long. al. 0.27.

Syn. *Sepedon fuscipennis* Loew, Wien. Ent. Monatsch. III, 299.

Of a rather dark chestnut color. Head a little paler. Front with a very wide excavation and an oblong black spot on each side near the orbit, and a deep black dot-like one below each antenna and a little removed from the orbit. Antennæ of the color of the head; the second joint, although elongated as in the other species of *Sepedon*, is broad as in *Tetanocera* and with black hairs; the third joint a little darker, rather acutely ovate, blackish at the tip. Antennal bristle white at the tip, and with a white pubescence, its two first joints and the base of the third being black. Upper side of the thorax in well-preserved specimens with a brown longitudinal stripe on each side; its middle is fine whitish hoary, and marked with four darker lines not quite reaching the hind border of the thorax, the innermost being by far more distinct. The scutellum, too, the greatest portion of the pleuræ and the coxæ are whitish hoary. Abdomen rather glossy, with a very slight vestige of whitish hoar. Legs pale chestnut-brown, hind femora with the apical half darker, and the greatest part of the under side beset with rather scattered black spine-like bristles; the anterior and posterior tibiæ at the tips and the tarsi blackish, the middle tarsi chestnut-brown at the base. The very delicate black hairs on the upper side of the posterior tibiæ are much longer in the male than in the female, and in general longer than usual in the species of this genus. Wings clouded with dark smoky brown, more yellowish-brown towards the costal border; the transverse veins with narrow blackish margins; the posterior transverse vein is considerably arcuated and has a very oblique position.

Hab. Middle States. (Osten-Sacken.)

2. S. macropus Walk. ♂.—Testaceus, antennarum articulo secundo tenui, femoribus posticis longissimis, gracilibus, fusco-annulatis.

Yellowish-red, second antennal joint narrow, posterior femora very long, slender, and marked with a brown ring. Long. corp. 0.3. Long. al. 0.35 lin.

Syn. *Sepedon macropus* Walker, List Dipt. IV, 1078.

Yellowish-red, with the inferior portion of the pleuræ as well as the hips having a bright white reflection. Front without lateral spots. Face glossy; below each antenna is a black spot distant from the orbit and surrounded with a white reflection on the polished face; another spot with bright white reflection runs from the under side of the eyes down the cheeks. Antennæ yellowish-brown; the second joint is slender and dark brown towards the tip; the third joint blackish with the antennal bristle beset with a very short pubescence. Thorax with a rather distinct reddish ferruginous middle stripe continuing over the scutellum (it may be more marked in better preserved specimens). The abdominal segments each with a browner margin of the hind border. Legs very elongated with very short spine-like hairs; the bristles on the under side of the very long, straight, not thickened hind femora are likewise very short; the hind tibiæ slender and almost straight. Color of the legs brownish-yellow, the tips of all femora being brown and the posterior femora having besides a brown ring on their last third; the anterior and middle tibiæ have only brown tips; the posterior tibiæ are quite brown with a very broad brownish-yellow ring before the tip; middle tarsi yellowish-brown, more blackish-brown towards the tip; hind tarsi quite dark brown. Wings clouded with brown; posterior transverse vein slightly curved, not very steep. This description has been taken from a rather old specimen.

Hab. Jamaica; (Walker.) Cuba; (Poey.)

3. S. armipes Loew. ♂ and ♀.—Brunneus, antennarum articulo secundo tenui, femoribus posticis incrassatis, in mare subtus profunde excisis et prope basim bidentatis.

Brown, second antennal joint slender, hind femora thickened, in the male with a deep excision on the under side and two teeth near the base. Long. corp. 0.18. Long. al. 0.18.

Syn. *Sepedon armipes* Loew, Wien. Ent. Monatsch. III, 298.

Not dissimilar to *Sep. spinipes*, but darker and somewhat smaller. Head pale yellowish, with the front and upper part of the occiput brown, the former having a black spot on each side near the orbit and a black dot below each antenna a little removed from the orbit. The two first joints of the antennæ brownish-yellow, the second attenuated as in most species of this genus; the third more or less lanceolate, black with the base only yellow. The first and second joints of the antennal bristle dark yellow, the third with the base blackish, the remainder being white with very short white pubescence. Upper side of the thorax finely hoary in the middle, on which some dark longitudinal lines are visible. Pleuræ dusted with white. Abdomen rather glossy, pale chestnut-brown or almost yellowish-red at the tip. Legs brownish-yellow, the femora paler, especially towards the base; the hind femora are somewhat spotted with brown at the tip; their under side has a rather deep excision, and immediately before this excision a coarse, almost two-beaded, hook, and farther to the base a smaller obtuse tooth, the space between the excision and the tip being beset with short black bristles. The femora of the female are simple. The posterior tibiæ of the male are much arcuated at the beginning of their last third, the two first thirds being almost quite straight; the tibiæ of the female are of a very similar structure, but not quite so much curved, by which character it is most readily distinguished from the female of *Sepedon pusillus*, the posterior tibiæ of which have a slighter and much more uniform arcuation. The anterior tibiæ are gradually blackened towards the tip, and also the anterior tarsi are rather black, the second and third joints only being paler than the rest; the middle tibiæ show no trace of black, but the tips of the middle tarsi are blackish as well as those of the hind tarsi. Wings smoky gray, more yellowish-brown on the costal border; the transverse veins with narrow black clouds; the posterior transverse vein is but little curved, and rather steep.

Hab. Middle States. (Osten-Sacken.)

4. S. pusillus Loew. ♂ and ♀.—Brunneus, antennarum articulo secundo tenui, femoribus posticis incrassatis, in utroque sexu simplicibus.

Brown, second antennal joint slender, femora thickened, simple in both sexes. Long. corp. 0.18. Long. al. 0.18.

Syn. *Sepedon pusillus* Loew, Wien. Ent. Monatsch. III, 299.

So very similar to the preceding species that a short enumeration of its differences will be sufficient to characterize it. The male is most readily distinguished from that of *Sep. armipes* by its hind femora being simple. The females of the two species are rather more difficult to separate; the most certain difference is given in the form of the hind tibiæ, which in *Sep. pusillus* are slightly and uniformly bent in their whole length, whereas in the female of *Sep. armipes* the arcuation is not only more considerable, but also affects chiefly the last third. All other differences are either uncertain or trifling; namely, the structure of the third joint of the antennæ does not afford any available character for distinguishing the two species, in opposition to what I was inclined to suppose when I had only a few specimens of both of them.

Hab. Middle States. (Osten-Sacken.)

Observation.—The genera *Actora* and *Dryomyza*, differing in some characters from the true *Sciomyzidæ*, are not comprised in the above exposition. I have not seen the N. A. *Actora*, published by Mr. Walker as *Actora ferruginea.* The two N. A. species of *Dryomyza* I know, fall both into that section which is characterized by a hairy third longitudinal vein; the first is, as it seems, identical with the European *Dryomyza anilis* Fall.; the second, though resembling in its colors *Dryomyza flaveola* Fabr., may easily be identified by the subjoined description.

Dryomyza simplex Loew.—Pallide flava, nitens, fronte et antennis saturate flavis, opacis; alæ cinereo-hyalinæ, venâ longitudinali tertiâ pilis longis vestitâ. Long. corp. 0.28. Long. al. 0.31.

Polished, pale yellow. Front deeper yellow, opaque, with the short pubescence and the bristles black. Antennæ concolorous with the front; antennal bristle with rather long and black hairs. Wings limpid, with a distinct yellowish-gray tinge; the third longitudinal vein beset with long hairs; the posterior transverse vein obsoletely clouded with grayish, the small transverse vein not clouded.

Hab. Middle States. (Osten-Sacken.)

IV.

ON THE NORTH AMERICAN EPHYDRINIDAE.

The family of *Ephydrinidæ* is taken here altogether in the extent which was given to it by Stenhammar, the diligent monographer of the Swedish species, and by Walker in his work on the British Diptera, the latter founded on Haliday's valuable observations.

The characters easily distinguishing the *Ephydrinidæ* from all the other families of *Diptera acalyptera* may be set down as follows: Face more or less, often considerably convex; either without any impression at all beneath the antennæ, or moderately impressed, but never provided with membranous antennal furrows. Antennæ short, first joint small; antennal bristle either nearly bare, or pubescent, or pectinated on the upper side only. Oral cavity rounded, in most of the genera of considerable size; clypeus distinct, in some genera retracted in the oral cavity, in the remaining genera prominent over the oral margin, in some of them of a rather large size; palpi small; mentum short, more or less incrassated. Thorax rather quadrangular; scutellum proportionately large. Abdomen of very variable form, consisting of six segments in the males; the females have one short, and generally not distinctly visible, segment more. The sixth segment being always small and generally much concealed under the fifth, the structural relations depend on the conformation of the five first segments; of these the first is often much shortened and sometimes nearly connate with the second, a circumstance which has led authors to omit it in the enumeration or to count the two first segments for one; this is to be borne in mind in order to understand their descriptions; in mine, I have always counted the first segment as distinct, however difficult it may be to observe it. The fifth segment is also of very variable structure, generally nearly equalling the foregoing in size, rarely considerably longer in both sexes or in the males, still more seldom much smaller, in which case the fourth segment, especially in the males, is longer than usual. The hypopygium of the male, which attains a considerable size in some species only, is turned down, and generally, together with the small sixth segment, encompassed by the lateral border of the fifth abdominal segment bending down over it. The anal extremity of the female, except in a few species, is entirely retracted; for this reason, the sexual difference of many species is somewhat difficult to ascertain on examining single dry specimens. Wings on their whole surface covered with microscopical hair; the costal vein consists of three parts, the first of which reaches from the base to a little beyond the transverse humeral vein, which, quite in its neighborhood, runs over to the costa; the second from thence to the tip of the first longitudinal vein, where the third begins. These three parts of the costal vein are not to be confounded with the three segments of the costal vein so frequently used in characterizing the species; the latter are reckoned from the base of the wing to the tip of the first longitudinal vein, from thence to the tip of the second longitudinal vein, and from this to the tip of the third longitudinal vein. The auxiliary vein is distinct only at its very base and then coalesces with the first longitudinal vein; the second basal cell, *i. e.* the anterior of the two small basal cells, unites with the discoidal cell, the ordinary separating vein disappearing, so that the discoidal cell apparently reaches very far towards the base of the wings; it is not at all unusual, that on a closer examination a rudiment of the obliterated transverse vein may be seen; the posterior of the two small basal cells or anal cell is generally imperfect and very small. Alulæ small. Legs slightly bristled; in some genera the species have some longer bristles on the upper side of the intermediate tibiæ, which in all genera are provided with spurs.

Most of the species, if not all, live in the neighborhood of water or in moist places. I have observed many years ago, that the food of several species chiefly consists of Infusoria. The larvæ of those European species, the metamorphosis of which is known, live, at least by far most of them, in water, some exclusively in water which is very decidedly salt; two of them are leaf-miners.

General division of the Ephydrinidae.

In order to facilitate the determination of the already numerous genera of *Ephydrinidæ* it will be useful to subdivide this family in several sections, which may be done as follows:—

1 Second joint of the antennæ unguiculated at the end, or at least, the upper side of the intermediate tibiæ beset with a few strong bristles. I. NOTIPHILINA.
Second joint of the antennæ not unguiculated, the intermediate tibiæ never have long bristles on the upper side. 2

2 Eyes hairy, oral cavity never of considerable size, anterior femora never incrassated. II. HYDRELLINA.
Eyes naked, oral cavity generally very large. III. EPHYDRINA.

The second joint of the antennæ is called unguiculated (*unguiculatum*) if it bears on its end a bristle directed forward, whether it be thickened and long, or thin and short. In the latter case it is often difficult to perceive, particularly in the genera *Paralimna* and *Corythophora*, which in the whole structure of their heads approach very much some genera of *Ephydrina;* yet the presence of several long bristles on the upper side of the intermediate tibiæ and the color and markings of their abdomens point out too evidently their relation to the species of the widely spread genus *Notiphila*, to be overlooked. The hairy eyes will be sufficient in general to enable us to recognize the *Hydrellina;* in those genera, the species of which have densely pilose eyes, the hairs are often exceedingly short; but their presence even then is easily known by the whitish reflection shown by the outline of the eyes. In the genera with scattered hairs on the eyes there are some species in which it is very difficult to perceive the single small hairs; in order to distinguish them with certainty from the *Ephydrina*, it is to be borne in mind that in the latter the eyes are much more rounded, that their faces are narrowest just where the antennæ are inserted, and considerably increase in breadth immediately below, whereas the *Hydrellina* have always more oblong eyes, and their faces have their least breadth beneath the antennæ; the oral cavity also is never so strikingly wide as in most genera of *Ephydrina;* moreover the clypeus in those species of *Hydrellina* which, on account of the indistinctness of the pubescence of the eyes, might be taken for *Ephydrina*, is very little developed.

I. NOTIPHILINA.

The second joint of the antennæ distinctly unguiculated, or the presence of some long bristles on the upper side of the intermediate tibiæ will refer any species to the present section, the genera of which have, without exception, an antennal bristle with long pectinations on the upper side.

Division 1. The costal vein reaches to the third longitudinal vein.

1 Abdominal extremity of the male with elongated bristles. Dichaeta *Meig.*
Abdominal extremity of the male without elongated bristles. Notiphila *Fall.*

Division 2. The costal vein reaches to the fourth longitudinal vein.

1 Upper side of the intermediate tibiæ with some long bristles. 2
Upper side of the intermediate tibiæ without long bristles. 3
2 Wings with a costal spine, posterior transverse vein perpendicular, legs not prolonged, clypeus very prominent. Paralimna *Loew.*
Wings without costal spine, posterior transverse vein oblique, legs prolonged, clypeus hardly projecting beyond the oral margin. Corythophora *Loew.*
3 Abdomen sharply edged, apparently three-jointed in both sexes on account of the minuteness of the first and fifth segments. Trimerina *Macq.*
Abdomen not sharply edged, fifth segment not so strikingly shortened, or only so in the males. 4
4 Abdomen broad. Discomyza *Meig.*
Abdomen not broad. 5
5 Superior half of the face not carinated, third joint of the antennæ more or less oblong. Psilopa *Fall.*
Superior half of the face distinctly carinated. 6
6 Eyes oblong, cheeks not descending much beneath the eyes. Discocerina *Macq.*
Eyes rounded, cheeks descending very much beneath the eyes. 7
7 Clypeus very prominent beyond the oral margin. Athyroglossa *Loew.*
Clypeus projecting very little beyond the oral margin. Hecamede *Hal.*

Of the enumerated genera I know *Dichæta*, *Notiphila*, *Paralimna*, *Discomyza*, *Psilopa*, and *Discocerina* as occurring in North America.

Gen. I. **DICHAETA** Meig.

This genus is closely related to the genus *Notiphila*. Both are distinguished by the remarkable stout spine of the second joint of the antennæ; the face is perpendicular and only moderately convex, the clypeus small and scarcely prominent beyond the border of the mouth; moreover, in both, the intermediate tibiæ are beset on the upper side with some long and stout bristles, and the thickened costal vein terminates already at the tip of the third longitudinal vein. The characters distinguishing both genera from each other are as follows: The species of *Dichæta* have longer and stouter bristles; the mystacidal bristles on the side of their face there are less numerous, but much longer and stouter; moreover, in the males of *Dichæta* the penultimate segment of the abdomen, on its posterior edge, is provided with a transverse row of very long bristles, and on the tip of the last segment, above the anal opening, there are two bristles inserted near each other and curved upwards, which is never the case in *Notiphila.*

Only two European species of *Dichæta* were hitherto known. The two species occurring in North America are identical with them.

Synopsis of the Species.

1 Last segment of the abdomen in the male prolonged in a conical point. 1 **caudata** *Fall.*
Last segment of the abdomen in the male not prolonged in a conical point. 2 **brevicauda** *Loew.*

1. D. caudata Fall. ♂ and ♀.—Nigricans, segmento abdominali penultimo in mare setis decem elongatis armato segmentoque ultimo in conum producto.

Blackish, the penultimate segment of the male abdomen with ten long bristles, the last segment conically prolonged. Long. corp. 0.17. Long. al. 0.17.

This well known species is distinguished from the following by its somewhat larger size, the greater number and the length of the bristles on the posterior border of the penultimate segment of the male abdomen, the conical prolongation of its last segment, and the much greater length of the two stout bristles inserted on the tip of this prolongation.

Hab. Middle States. (Osten-Sacken.)

Note.—A detailed description of this species is to be found in Meigen, Zweifl. VI, p. 62.—O. S.

2. D. brevicauda Loew. ♂.—Nigricans, segmento abdominali penultimo in mare setis sex elongatis armato segmentoque ultimo breviter acuminato.

Blackish, the penultimate segment of the male abdomen with six long bristles on the posterior border, the last segment but little pointed. Long. corp. 0.16. Long. al. 0.16.

The differences pointed out in the description of the foregoing species will be sufficient to distinguish this. The greater part of the tarsi is dull red, as in *Dich. caudata*, but generally somewhat paler.

Hab. Middle States. (Osten-Sacken.)

Note.—This species has been described for the first time by Mr. Loew in 1860 in his paper: *Die Europæischen Ephydriniden* (in Loew's *Neue Beitraege*, VII, p. 5).—O. S.

Gen. II. NOTIPHILA Fall.

The characters of this genus result from what has been said about *Dichæta.* Those which distinguish it most easily from the following genera are the intermediate tibiæ being provided on the upper side with single long bristles, and the thickened costal vein terminating at the tip of the third longitudinal vein.

We need scarcely mention that but few of the species described by the older authors as *Notiphilæ*, belong to it, in the restricted sense necessary here. Taken in this sense, about sixteen European species have to be referred to it, some of which, however, are not yet duly established. In North America it seems to be represented by numerous species which, compared to those of Europe, show nothing heterogeneous in their organization. The same observation may be made with regard to the South African species which occur on the Cape of Good Hope.

Synopsis of the Species.

1	Palpi blackish.	1 **scalaris**, n. sp.
	Palpi yellowish.	2
2	Antennæ quite black.	2 **bella**, n. sp.
	Third joint of the antennæ red at the base.	3
3	Upper side of the thorax with a broad brown lateral stripe.	3 **vittata**, n. sp.
	Upper side of the thorax without broad brown lateral stripe.	4
4	Abdomen with irregular brownish-black semifasciæ, each formed of two spots.	4 **carinata**, n. sp.
	Abdomen with two brown spots on each of the intermediate segments.	5 **unicolor**, n. sp.

1. N. scalaris Loew. ♂ and ♀.—Obscure cinerea, facie angustâ fulvescente, antennis palpisque nigris, abdomine fasciis nigris, lineâ longitudinali cinereâ interruptis picto, pedibus nigris, genibus tarsisque posticis testaceis, tarsis anticis testaceo-annulatis.

Dark ashy-gray, the small face yellow, antennæ and palpi blackish; abdomen with two transverse fasciæ, interrupted by a gray middle line;

legs blackish, knees and hind tarsi yellowish, anterior tarsi annulated with yellowish. Long. corp. 0.13. Long. al. 0.16.

Very much resembling *Notiph. uliginosa* Hal. (which is identical with *Notiph. tarsata* Stenh.), but its narrower face distinguishes it from that and all the related European species. Palpi blackish. Antennæ entirely black; front with yellowish-brown on black ground. The same is the case with the upper side of the thorax, which has no broad longitudinal stripes, but only a faint trace, often indistinct, of five fine, brown longitudinal lines. The scutellum is colored as the upper side of the thorax, but generally with a rather lighter gray border and longitudinal line. Abdomen gray, with broad brownish-black fasciæ occupying more than the anterior half of each segment, and being interrupted by a gray middle stripe; the last segment in the male is almost entirely black, and has a gray middle stripe on its anterior half. Femora and tibiæ black; the knees and the extreme tips of the tibiæ brownish-yellow; the fore tarsi black, having the innermost base of each joint yellowish; the posterior tarsi yellowish, with the tip brownish. Wings pellucid brownish-gray, with brown veins; the second segment of the costal vein being nearly twice as long as the third.

Hab. Middle States. (Osten-Sacken.)

2. N. bella Loew. ♂ and ♀.—Cinerea, antennis totis nigris, palpis flavis, vittâ thoracis utrinque laterali, pleurarum superiore, scutellique margine laterali brunneis.

Ashy-gray; antennæ entirely blackish, palpi yellow; a longitudinal stripe on each side of the upper side of the thorax, a longitudinal stripe on the pleuræ, and the lateral edge of the scutellum, brown. Long. corp. 0.14. Long. al. 0.17.

Face yellowish. Eye-rings rather broad. Cheeks descending considerably beneath the eyes. Antennæ entirely blackish. Front gray, viewed sideways rather whitish; the divided black middle stripe is more or less covered with thick light-gray dust, which is sometimes of a yellowish tinge, sometimes more light-gray; near the lateral border [*of the thorax?—O. S.*] there is a broad, well-defined, dark-brown longitudinal stripe. Such a stripe runs on the upper part of the pleuræ from the shoulder to near the base of the wing. The brown color of the lateral border of the scutellum continues on the posterior border of the thorax as a short beginning of a stripe. Abdomen with four rows of long, triangular, blackish-brown spots, the interior of which are a little longer that the exterior ones. Coxæ and femora black, covered with light-gray hoar; the tips of the latter brownish-yellow. Tibiæ and tarsi rather pale brownish-yellow, the hind tibiæ with a broad, the middle and fore tibiæ with a narrow blackish-brown ring, which is sometimes wanting; the last joint of the tarsi brownish. In the male, the middle femora, on the under side, are beset with short, but very thick, black hair, the middle tibiæ on the under side fringed with very close, short, black pubescence. Wings grayish, proportionally long and narrow; veins brown; the second segment of the costa nearly thrice as long as the third.

Hab. Middle States. (Osten-Sacken.)

3. N. vittata Loew. ♀.—Fusca, facie laete ochraceâ, antennarum articuli tertii basi sordide rufâ; thoracis vittâ laterali, pleurarum superiore scutellique margine laterali obscure brunneis, abdomine macularum nigrarum seriebus quatuor picto, femoribus nigris, tibiis late nigro-annulatis.

Brown; face bright ochraceous, third joint of the antennæ dull red at the base; a longitudinal stripe on each side of the upper side of the thorax, a longitudinal stripe on the pleuræ and the lateral border of the scutellum dark-brown; abdomen with four rows of black spots; femora black, tibiæ with a broad black ring. Long. corp. 0.16. Long. al. 0.18.

The most robust among the known North American species. Face of middle breadth, rather bright yellow. Palpi yellow. Antennæ black, third joint at its base dull red for a considerable distance. Front, thorax, and scutellum dusted with brown. The upper side of the thorax has on each side, near the lateral border, a broad, well-defined, dark-brown stripe, and, moreover, on its middle, some much less distinct brown longitudinal lines. Pleuræ grayer than the upper side of the thorax, above with a broad, dark-brown, longitudinal stripe, running from the shoulder to the base of the wing, and another incomplete brown longitudinal stripe immediately above the longitudinal suture. Lateral border of the scutellum blackish-brown. Upper side of the abdomen dusted with gray and having four rows of black spots, those of the two interior rows being longer and more triangular, those of the exterior rather shorter and more trapezoidal. Femora black; tibiæ and tarsi yellowish, the former with a broad brownish-black fascia, which, on the anterior tibiæ, leaves only the base and tip free; the tarsi, on account of their hair, appear darker than they really are.

Wings distinctly tinged with brown; veins brown; the second segment of the costal vein scarcely twice as long as the third.

Hab. Middle States. (Osten-Sacken.)

4. N. carinata Loew. ♀.—Cinerea, facie angustâ concolore, antennarum articuli tertii basi rufâ, thoracis dorso scutelloque brunneis, abdomine fasciis interruptis nigro-brunneis, postice emarginatis, picto, pedibus nigris, tibiis tarsisque posterioribus testaceis, tibiis posticis nigro-annulatis.

Ashy-gray, the narrow face ashy-gray; base of the third joint of the antennæ red; upper side of the thorax and scutellum brown; abdomen with interrupted blackish-brown fasciæ, which are emarginated posteriorly; legs black, middle and posterior tibiæ and tarsi brownish-yellow; hind tibiæ with a black ring. Long. corp. 0.13. Long. al. 0.16.

Face gray, rather narrow, indeed remarkably narrower and with a more extended and sharper keel on its upper part than in the similar European species *Notiph. annulipes* Stenh. and *Notiph. dorsata* Stenh. Palpi yellow, antennæ black; the third joint with the basal half yellowish-red. Front, upper side of the thorax, and scutellum, grayish-brown, or even almost brownish-yellow; upper side of the thorax without lines or stripes. Pleuræ ashy-gray, brownish above. Abdomen on the basal half of each segment with two blackish-brown semifasciæ, emarginated posteriorly, which on the last segment dissolve themselves more or less into the two spots composing them. Anterior legs entirely black, only the knees and the extreme tips of the tibiæ being brownish-yellow. Middle and posterior tibiæ and tarsi brownish-yellow; hind tibiæ with a brownish-black band; tips of the tarsi brownish. Wings of a rather dull gray, veins brown; the second segment of the costal vein a little more than twice as long as the third.

Hab. Middle States. (Osten-Sacken.)

5. N. unicolor Loew. ♂.—Flavo-cinerea, facie laetius flavâ, abdominis segmentis duobus intermediis brunneo-bimaculatis, femoribus nigris, genibus, tibiis tarsisque flavo-testaceis, anticis fuscanis.

Yellowish-gray, face of a brighter yellow; the two middle segments of the abdomen each with two brown spots; femora black, knees, tibiæ and tarsi brownish-yellow; the fore ones more brownish. Long. corp. 0.13. Long. al. 0.16.

Entirely yellowish-gray. Face bright yellow, rather broad; cheeks descending beneath the eyes a little more than usual. Palpi dark yellow. Third joint of the antennæ with the basal half reddish-yellow. Thorax without lines or stripes. Abdomen very unicolorous, having only on each of the two middle segments two triangular brown spots of middle size; of the two exterior rows of spots, which generally occur on the abdomens of the *Notiphilæ*, nothing is to be seen here. Femora black, appearing gray in consequence of their being dusted, with yellowish tips. Tibiæ and tarsi brownish-yellow; fore tibiæ towards their tips and fore tarsi brownish on their whole extent; the posterior tarsi only with their last joint brown. The short hair, resembling fringes, on the under side of the middle femora and tibiæ is rather thin. Wings rather sandy-yellowish, particularly at the base, the second segment of the costal vein is a little more than twice as long as the third. This species resembles most the European *Notiph. guttiventris* Stenh., but is easily distinguished from it by its smaller size and more yellow color, by the cheeks descending deeper beneath the eyes and by the much less spotted abdomen.

Gen. III. **PARALIMNA** Loew.

The characters of this genus, of which I hitherto only know South African and North American species, are the following. Structure, colouring, and markings as in *Notiphila*. Eyes much rounded; front and face very broad, the latter slightly convex; eye-rings broad; cheeks descending very deeply beneath the eyes; clypeus prominent; palpi narrow; terminal bristle of the second joint of the antennæ very small and hardly visible; the third joint of the antennæ very distinctly hairy on its upper side and tip; the antennal bristle with long rays. Structure of the thorax, scutellum, and abdomen as in *Notiphila*. Middle tibiæ on their upper side with three long bristles, the first being very near the base, the second immediately before the middle, and the third not far from the end. Wings as in *Notiphila*, only with the exception of the thickened costal vein being extended to the tip of the fourth longitudinal vein.

1. P. appendiculata Loew. ♂ and ♀.—Brunnea, fronte, thorace scutelloque obscurius punctatis; facie fasciisque interruptis abdominis nigri canis; palpis, antennis pedibusque nigris, tarsorum anticorum posticorumque basi rufâ; alis cinereis, venis transversis et venulâ appendiceâ e penultimo venæ quartæ segmento ascendente nigro-limbatis.

Brown, front, thorax and scutellum with darker dots; the face and the interrupted fasciæ of the black abdomen are grayish-white; palpi, antennæ, and tarsi black, the fore and hind tarsi red at the base; wings gray, the transverse veins and an additional veinlet being placed on the anterior side of the penultimate segment of the fourth longitudinal vein, are bordered with black. Long. corp. 0.16—0.18. Long. al. 0.16—0.18.

Face dusted with grayish-white, usually with some more brownish spots, sometimes with a more yellowish-gray tinge; it is slightly convex, but not even, eye-rings broad; viewed laterally, they show at their upper end two black spots, united by a white transverse line, which disappear when viewed in other directions. The very projecting clypeus is of the same color as the face. Proboscis thick and black; palpi narrow, rather long and black. Antennæ black, the third joint in certain directions with a whitish-gray reflection; the hair on the upper side and the tip remarkably long. Front brown, anteriorly with some small dots, further back with some nearly black spots. Thorax and scutellum brownish, with numerous close, small, dark-brown dots; pleuræ also dotted. Abdomen brownish-black, rather opaque, on the posterior border of each segment with a whitish-gray, very opaque fascia, a little widened on its middle, and intersected by a brownish-black middle stripe. The two halves of the gray fascia of the second segment are sometimes connected on their posterior margins; the fifth abdominal segment of the male is a little longer than the preceding. Legs entirely black, the fifth joint of the fore and hind tarsi clothed with shining felt of a bright reddish-yellow; the first joint of the fore tarsi at its base, and the first joint of the hind tarsi almost to its tip, are usually red; paler specimens have also the first joint of the middle tarsi red; in darker ones the first joint of the anterior tarsi is entirely black. Wings gray, veins brown; the second half of the costal vein, the end of the third longitudinal vein, and nearly the whole fourth and fifth longitudinal veins, rather black; the transverse veins and a small stump, emitted by the fourth longitudinal vein about the middle of its penultimate segment, black and narrowly bordered with black; the second segment of the costal vein more than twice as long as the third.

Hab. Middle States. (Osten-Sacken.) Georgia.

Gen. IV. DISCOMYZA Meig.

The characters of this genus are as follows. Head more or less orbicular, with very sharp borders of the vertex; second joint of the antennæ unguiculated, the third oblong, with long pectinations of the terminal bristle. Face not keeled, rather convex, receding again towards the edge of the mouth, uneven, on the sides with coarse warts and wrinkled. Clypeus entirely concealed. Abdomen flat, broad, on account of the shortening of the first segment apparently consisting of four rather equally broad segments. Wings proportionately broad, third and fourth longitudinal veins parallel at their ends.

There were only two species hitherto known; the following North American species deviates a little by its head not being so strikingly orbicular, and by its abdomen not being so broad, but more flattened.

1. D. balioptera Loew. ♂.—Nigra, thorace punctulato, antennis genibusque rufis, tarsis posterioribus flavescentibus, alis fusco-maculatis.

Black, with dotted thorax; antennæ and knees yellowish-red, middle and posterior tarsi yellowish; wings dotted with brownish-black. Long. corp. 0.15. Long. al. 0.14.

Head shining black, really not so orbicular as in *Discom. incurva*, but the vertical border likewise very sharp. Front anteriorly with two rather flat depressions, placed near each other; the more shining lateral border of the front rather wrinkled. Antennæ yellowish-red, the upper border of the second and third joints a little darker; the antennal bristle with long pectinations. The middle of the face narrow and rather transversely wrinkled; its lateral parts with coarse warty wrinkles; the eyes surrounded with a fine white line. The upper side of the thorax and scutellum appear to be dusted with white, but have a rather indistinct, exceedingly fine and close punctuation, leaving only small traces of the white dust. On the pleuræ, where the punctuation is more distinct and much coarser, the whitish dust is more visible. Abdomen black, rather shining, exceedingly flat, narrower than in *Discom. incurva*, the cause of which may be that the upper horny plates of the abdomen are turned down to an unusual extent; the last segment of the abdomen rather smaller than the preceding ones. Legs black, knees yellowish-red; middle band of the posterior tarsi pale yellowish, having the last joint rather blackened. Poisers whitish with darker petiole. Wings short and broad, clouded with grayish; the small transverse vein is below the tip of the first longitudinal vein; the posterior transverse vein rather distant from the margin of the wing and rather oblique; the two last segments of the fourth longitudinal vein of equal length; the second segment of the costal vein less than twice as long as the third; the transverse veins with broad brownish-black borders; a spot of the same color lies between the third and fourth longitudinal veins a little before the posterior transverse vein; a larger spot of the same color lies before it on the costal margin, reaching to the third longitudinal vein and being connected with an equally large, blackish-brown spot on the apex of the wing, which almost attains the fourth longitudinal vein.

Hab. Cuba. (Poey.)

Gen. V. **PSILOPA** Fall.

The characters of the genus *Psilopa* are as follows. Second joint of the antennæ with a stout spine; third oblong, the bristle with long pectinations. Face on its upper part without any keel, slightly convex everywhere, not wrinkled on its sides, receding towards the opening of the mouth. Clypeus either quite concealed or scarcely projecting beyond the oral margin. Middle tibiæ without long bristles on their upper side. The costal vein thickened and attaining the fourth longitudinal vein.

This genus is represented in Europe by about twelve species known with more or less certainty. Its representatives in North America seem to be more numerous; a number of them are distinguished from the European ones by a more robust structure and a more strikingly dusted appearance, and by their faces being not exactly smooth and their cheeks descending a little deeper beneath the eyes; but neither the number of the species of this group hitherto known is large enough, nor are the characters such as to render a generic separation necessary. On the contrary, it will be sufficient for the present, to put these species together as a subdivision of the genus *Psilopa.*

Synopsis of the Species.

Division 1.—Middle of the face slightly convex without any elevation on it.

1 { Thorax finely aciculate. 1 **aciculata** nov. sp.
Thorax polished. 2

2 { Posterior part of the thorax and scutellum bronze-colored. 2 **scoriacea** nov. sp.
The whole body pure black. 3 **atra** nov. sp.

Division 2.—Middle of the face slightly convex with some flat longitudinal impressions.

1 { Abdomen black. 4 **umbroaa** nov. sp.
Abdomen steel-colored. 5 **caeruleiventris** nov. sp.

1. P. aciculata Loew. ♀.—Thorace scutelloque nigris, transverse subtiliter aciculatis, capite abdomineque aut ex cupreo aut ex viridi æneseentibus, antennis flavis, pedibus nigris, tibiarum apice tarsisque flavescentibus, basi alarum sublutescentium nigrâ.

Thorax and scutellum black, transversely with fine scratches; head and abdomen either coppery or greenish brassy; antennæ yellow; legs black, tips of the tibiæ and tarsi yellowish; the rather yellowish wings with the base black. Long. corp. 0.09. Long. al. 0.1.

Antennæ entirely reddish-yellow. Front and face shining, either dull coppery or even almost metallic black, or metallic green. The thorax and the proportionately large scutellum black, hardly brassy, everywhere covered with close and exceedingly fine scratches. Abdomen polished, shining, the color varying in the same way as that of the face. Legs shining black, knees indistinctly yellowish-brown; tips of all the tibiæ yellowish as well as all the tarsi; last joint of the tarsi blackish at its tip only. Poisers brownish-black. Wings rather clay-colored, blackish at the base; this blackening of the costal margin reaches a little beyond the middle of the first segment, on the disk of the wing only as far as the basal transverse veins; towards the posterior margin it extends in such a way, as to occupy half of the corner of the wing lying behind the fifth longitudinal vein, but it becomes at the same time very pale.

Hab. Cuba. (Poey.)

2. P. scoriacea Loew. ♀.—Atra, nitida, colore in posteriore thoracis parte scoriaceo, in scutello obscure æneo, proboscide pedibusque nigris, tarsis posticis fuscis, alis cinereo-hyalinis.

Black, shining; the posterior part of the thorax scoriaceous; scutellum dull brassy; proboscis and legs black, hind tarsi brown; wings grayish-glassy. Long. corp. 0.1. Long. al. 0.13.

Shining black. Head proportionately broad, shining black; above the antennæ with a small, dilated spot dusted with whitish. Face broad, shining black, viewed laterally, more brownish-black; viewed from above it appears as if dusted with white. Antennæ deep black; antennal bristle with long pectinations. Proboscis and palpi perfectly black. Thorax shining black, scoriaceous posteriorly; immediately before and on the flat scutellum the color is more of a dull brassy green. Abdomen shining black, slightly dusted. Legs black; the posterior tarsi appear rather dark brown to the naked eye, viewed through a lens their color is almost dull whitish, the dark appearance being caused by the black hair. Poisers white. Wings grayish glassy; the second segment of the costal vein is not half as long again as the third.

Hab. New York. (Schaum.)

3. P. atra Loew. ♂.—Atra, nitida, proboscide halterumque capitulo albidis, basi tarsorum posticorum rufâ, alis hyalinis.

Shining black, proboscis and knob of the halteres whitish; base of the posterior tarsi red; wings glassy. Long. corp. 0.12. Long. al. 0.16.

Shining black; head broad, front shining black; the small white-dusted spot above the antennæ and the whitish, exceedingly fine dust of the broad, shining black face are scarcely perceptible. Proboscis yellowish-white. The palpi seem to be black. Antennæ black; the bristle with very long pectinations. Abdomen shining, scarcely with a trace of dust, rather narrow and flat, apparently consisting of four segments, the first being very much shortened; even the sixth, however, is perceptible. Legs black; middle and hind tarsi red at the base. Halteres with blackish petiole and white knob. Wings glassy, slightly grayish; the second segment of the costal vein not quite half as long again as the third.

Hab. Middle States. (Osten-Sacken.)

4. P. umbrosa Loew. ♀.—Nigra, fronte, thoracis dorso et scutello polline brunneo-cinereo tectis, facie griseo-pollinosa, antennis tarsorumque basi ex rufo flavis, alis adversus marginem anteriorem nigricantibus, halterum capitulo albo.

Black; front, upper side of the thorax and scutellum dusted with ashy-gray with a fuscous tinge, face dusted with whitish-gray; antennæ and bases of all the tarsi reddish-yellow; wings blackened towards the costa; knob of the poisers white. Long. corp. 0.13. Long. al. 0.14.

Black; front, thorax and scutellum thickly dusted with ashy-gray with a fuscous tinge. Antennæ reddish-yellow; the bristle with scattered pectinations. Face thickly-dusted with whitish-gray, rather of uniform breadth, with more numerous bristles on the sides than in most other *Psilopæ*, generally slightly convex, with the lower part a little projecting, but towards the border of the mouth again remarkably receding, rendering thus the opening of the mouth smaller than is usual in this genus. Proboscis and tarsi blackish. Pleuræ brownish-black, shining. Abdomen shining black with very little visible dust. Legs shining black; tarsi reddish-yellow, the three last joints of the foremost, and only the two last of the hindmost ones being black. Poisers with brown petioles and white knob. Wings clouded with grayish-black, becoming gradually black towards the costa; the posterior transverse vein scarcely perceptibly margined with blackish; the second segment of the costal vein more than half as long again as the third.

Hab. Cuba. (Poey.)

5. P. caeruleiventris Loew. ♀.—Capite thoraceque cinereis opacis, abdomine chalybeo nitido, antennis palpisque flavis, pedibus nigris, tarsis posterioribus rufis, alis hyalinis vittâ latissimâ atrâ, margini antico contiguâ, pictis.

Head and thorax opaque ashy-gray, abdomen shining steel-blue; antennæ and palpi yellow; legs black, posterior tarsi red; wings hyaline, with an exceedingly broad, deep black longitudinal stripe on the costa. Long. corp. 0.15. Long. al. 0.16.

Front ashy-gray. Antennæ reddish-yellow. Face whitish-gray, slightly convex, with rather slender small bristles on the sides; oral cavity small; clypeus projecting a little beyond the border of the oral margin. Palpi pale yellowish, a little broader than usual. Upper side of the thorax ashy-gray without any gloss. Pleuræ thinly dusted with grayish, and consequently blacker and rather glossy. Scutellum dusted with brown, shining black at the tip. Abdomen shining steel-blue; the first segment but little shortened, the second as long as the first, the three following longer; even the narrow sixth segment is distinctly visible. Legs black, the foremost with dark brown knees; middle and hind tarsi yellowish-red with blackish-brown tip; the fore tarsi have only the base brownish-red. At the costal margin of the wing there is a broad, deep-black band, running from the base to the tip of the third longitudinal vein; its posterior limit runs from the base of the wing along the middle of the discoidal cell to nearly the posterior transverse vein, recedes from it suddenly almost to the third longitudinal vein, follows this vein first at a little, then gradually at a greater distance, and lastly turns to its tip; the posterior part of the wing is rather dull glassy, and almost grayish at the axillary angle; the veins in the latter are brownish, those in the blackish parts of the wing black. The place of this species in the system is very deceptive; for at a superficial view the thickened costal vein seems to reach only the third longitudinal vein; but this deception arises from its color being black as far as the third longitudinal vein, and very pale between this and the fourth.

Hab. Cuba. (Poey.)

Gen. VI. **DISCOCERINA** Macq.

The second joint of the antennæ has a distinct spine, the third is rounded; the bristle pectinated. The face on its upper part is distinctly keeled, in the middle more or less inflated, receding again towards the border of the mouth. Clypeus projecting very little beyond the border of the mouth or entirely concealed; cheeks moderately descending beneath the eyes. The costal vein attains the fourth longitudinal vein. Upper side of the intermediate tibiæ without stout bristles. *Discocerina* stands between the genera *Psilopa* Fall. and *Hecamede* Hal., being distinguished from *Psilopa* by the more rounded form of the third joint of the antennæ and the keel on the upper part of the face; from *Hecamede* chiefly by the cheeks descending much less beneath the eyes. I can describe only two North American species of this genus, yet four are known to me as occurring in Europe. [Three more species, reproduced below, have been published by Mr. Loew since.—O. S.]

1. D. lacteipennis Loew. ♂.—Cinerascens, opaca, antennis, genibus, tibiarum apice tarsisque flavis, alis albidis, venâ costali atrâ.

Opaque, ashy gray; antennæ, knees, tibiæ at the tips and tarsi yellow; wings whitish with deep black costal vein. Long. corp. 0.11. Long. al. 0.12.

Very similar to the European *Hecamede costata* Loew, but easily distinguished by its cheeks descending much less beneath the eyes. Front with yellowish-gray dust. Antennæ reddish-yellow, the third joint a little infuscated on its apical margin; bristle with a few rays. Face a little more yellowish than the front, distinctly keeled on its upper half, then moderately convex, and receding a little towards the border of the mouth. Eye-rings downwards rather broad; the uppermost of the bristles, inserted near the eye-rings, is more removed towards the middle of the face. Cheeks remarkably descending beneath the eyes for a *Discocerina*. Palpi pale yellowish. Upper side of the thorax and scutellum rather light ashy-gray. Pleuræ more whitish-gray. Abdomen light ashy-gray, appearing, on account of the shortness of the first segment, to consist of four segments, the last of which is at least as long again as the penultimate. Femora and tibiæ black, the former with the extreme tips, the latter with the base and tip yellowish to a greater extent. Tarsi yellowish with blackish tips. Halteres whitish. Wings whitish, especially if viewed in an oblique direction. Costal vein black, the other veins remarkably paler; the second segment of the costal vein is about half as long again as the third.

Hab. Washington. (Osten-Sacken).

2. D. parva Loew. ♀.—Obscure cinerea, opaca, abdomine nigricante; antennis, genibus, tibiarum apice tarsisque flavis, alis cinereo-hyalinis.

Dark ashy gray, opaque, abdomen rather black; antennæ, knees, tibiæ at their tips and tarsi yellow; wings grayish-hyaline. Long. corp. 0.07. Long. al. 0.09.

Though similar to *Discoc. lacteipennis*, it is easily distinguished by its much smaller size, nearly black abdomen and grayish-hyaline wings not showing any trace of whitish color. Antennæ brownish-yellow, second and third joints brownish on the upper margin; bristle with four or five long rays. Face dusted with whitish-gray, very distinctly keeled on its upper half, farther beneath rather convex, and receding a little again towards the border of the mouth; in proportion to the size of the insect, it is narrower than in *Discoc. lacteipennis.* Eye-rings exceedingly narrow, not becoming broader downwards. Among the bristles standing in its neighborhood, the uppermost is a little more advanced towards the middle of the face. Cheeks descending only a little beneath the eyes. Palpi brownish-yellow. Upper side of the thorax and scutellum blackish ashy gray, opaque; the pleuræ likewise. Abdomen grayish-black, opaque, almost pure black and shining towards the end; first segment not strikingly shortened. Femora and tibiæ black; knees, tibiæ at their tips and tarsi yellowish. Halteres white. Wings grayish-hyaline, with blackish-brown veins; the second segment of the costal vein is at least half as long again as the third.

Hab. Washington. (Osten-Sacken.)

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3. D. orbitalis Loew. ♂. (Translated from Berl. Entom. Zeitschr. 1861, p. 354, by R. Osten-Sacken.)—Cinerea, opaca, colore thoracis magis in ochraceum, abdominis in nigrum vergente, antennis rufis, oculorum orbitâ candidâ, alis hyalinis, segmento costali secundo tertii longitudinem modice superante.

Cinereous, opaque, color of the thorax merging in ochraceous, that of the abdomen in black, antennæ rufous, orbit of the eyes shining white, wings hyaline, second costal segment a little longer than the third. Long. corp. 0.065. Long. al. 0.07.

Head obscure cinereous, opaque, orbit of the eyes rather broad, not dilated below the eyes, shining white. Face rather broad, the upper half distinctly keeled, the lower half convex, about six small bristles each side, which are more distant from the orbitæ than is generally the case in this genus. Cheeks moderately narrow. Antennæ rufescent, third joint rather obscure. On the upper side of the thorax and on the scutel the cinereous color merges in ochraceous; pleuræ somewhat hoary. Abdomen darker than the rest of the body, black towards the apex, very slightly glossy. Femora black, hoary, with a whitish pollen; tibiæ and tarsi yellowish, the former with a broad brown ring, the latter with the tip brown. Halteres white. Wings pure hyaline; second segment of the costa a little longer than the third.

Hab. Washington. (Osten-Sacken.)

4. D. simplex Loew. (Translated from Berl. Entom. Zeitschr., p. 355, by R. Osten-Sacken.)—Cinerea, opaca, antennis nigris, setis faciei utrinque duabus, genis latioribus, tarsis flavescentibus, apicem versus nigris, alis hyalinis.

Cinereous, opaque, antennæ black, two bristles each side of the face, cheeks rather broad, tarsi flavescent, black towards the apex, wings hyaline. Long. corp. 0.07. Long. al. 0.09.

Very like *D. lacteipennis*, but easily distinguished by its black antennæ, the smaller number of facial bristles and their different position, finally, by its hardly whitish wings. Cinereous, opaque. Front rather broad, a little darker than the remainder of the body, with an impressed longitudinal line on each side; frontal lunule very narrow, whitish pollinose. Antennæ black, a whitish pollinose dot on the upper edge of the second joint, bristle pectinated with four or five long hairs. Face moderately broad, gibbous, its upper half distinctly keeled, the lower one convex, receding at the aperture of the mouth. Two bristles on each side of the face, approximated to the eyes. The very narrow orbit of the eyes becomes broader on their under side. Cheeks broader than in most *Discocerinæ*. The cinereous color merges into yellowish on the thorax; on the upper side of the abdomen, especially towards the apex, it becomes more distinctly hoary. Feet concolorous to the rest of the body, hoary with a whitish pollen; anterior tarsi yellowish, blackish towards the tip; hind tarsi entirely obscure. Halteres white. Wings hyaline, slightly tinged with an impure whitish, costal vein not incrassated.

Hab. Maryland. (Osten-Sacken.)

5. D. leucoprocta Loew. ♀. (Translated from Berl. Entom. Zeitschr. 1861, p. 355, by R. Osten-Sacken.)—Cinerea, abdominis atri segmento ultimo niveo, alis hyalinis.

Cinereous, abdomen black, its last segment snow white, wings hyaline. Long. corp. 0.064. Long. al. 0.07.

Front brownish-cinereous, opaque. Antennæ rufous, third joint fuscous, bristle pectinated with five or six long hairs. Face yellowish-white, its upper half keeled, the lower one convex, furnished on each side with three strong bristles. The narrow cheeks, as well as the whole orbit of the eyes, are whitish. Upper side of the thorax blackish-cinereous, opaque, with short black hairs. Pleuræ whitish pollinose. Scutellum concolorous with the thorax. Abdomen black, opaque, last segment rather short, shining white. Fore coxæ black, with a white reflection, yellowish at the tip; trochanters yellow; femora black, cinerascent with a whitish pollen, tip yellow; fore and hind tibiæ black, yellow at basis and apex; the intermediate ones entirely flavescent; all with a whitish reflection on the upper side; tarsi yellow, last joint blackish. Wings hyaline, the third segment of the costa is equal to two-thirds of the length of the second.

Hab. Maryland. (Osten-Sacken.)

II. HYDRELLINA.

The tribe of *Hydrellina* is characterized by the hairy eyes, the absence of a spine on the second joint of the antennæ, and the absence of long bristles on the upper side of the middle tibiæ. The eyes in some genera are covered with very short, close hairs; in other genera these hairs are only scattered, but much longer. Haliday restricts the *Hydrellina* to the genera *Glenanthe*, *Hydrellia*, and *Atissa*. It seems that some other genera, as *Philygria*, *Hyadina*, and *Axysta* can by no means be separated from the *Hydrellina*, to which they are much more closely related than to the *Ephydrina* by their whole organization, and chiefly by the structure of the head. The hairs on the eyes of some species of the three last named genera being very sparingly scattered, and therefore difficult to observe, perhaps it will not be superfluous to remark that in the *Hydrellina* the eyes are always longer and the face is narrowest beneath the eyes, whereas in all *Ephydrina* the eyes are rounder, the horizontal diameter being sometimes even longer than the vertical, so that the antennæ stand where the eyes are most approximated, and the face increases much in breadth immediately below them. Moreover, in the *Hydrellina* the hole of the mouth is never strikingly widened, and the face downwards never projects much, whereas the great width of the oral cavity and the great projection of the inferior part of the face is a most striking character for the *Ephydrina*, excepting only the genera *Pelina* and *Ochthera*. A confusion between the two last named genera with any genus of the *Hydrellina* is sufficiently prevented by the entire bareness of their eyes.

The genera of *Hydrellina* may be arranged as follows:—

	Division 1. Eyes with exceedingly close hair.	
1	Antennal bristle with a short pubescence.	GLENANTHE *Hal.*
	Antennal bristle pectinated.	2
2	Face convex.	HYDRELLIA *Desv.*
	Face impressed.	ATISSA *Hal.*
	Division 2. Eyes with scattered hair.	
1	Face with bristles on both sides.	PHILYGRIA *Stenh.*
	Face almost bare.	2
2	Costal vein running to the tip of the fourth longitudinal vein.	HYADINA *Hal.*
	Costal vein running to the tip of the third longitudinal vein.	AXYSTA *Hal.*

North American species of the genera *Hydrellia* and *Philygria* only are known to me.

Gen. I. HYDRELLIA R. Desv.

The species of *Hydrellia* are very easily recognized by the very short but exceedingly close pubescence of the eyes, and by the pectinations of the antennal bristle. The other characters are: Second joint of the antennæ not unguiculated; face rather narrow and perpendicular, slightly convex, receding a little towards the border of the mouth; opening of the mouth not widened; cheeks descending very little beneath the eyes. Legs rather slender; middle tibiæ on their upper side without bristles; costal vein extending to the tip of the fourth longitudinal vein.

*Synopsis of the Species.**

1	Anterior coxæ yellow.	1 **ischiaca**, n. sp.
	Anterior coxæ blackish.	2
2	Face snowy white.	2 **hypoleuca**, n. sp.
	Face not white.	3
3	Face brownish-black, opaque.	3 **obscuripes**, n. sp.
	Face yellow.	4
4	Face dark yellow, narrow, much dilated below.	4 **scapularis**, n. sp.
	Face pale yellow, rather broad, but little widened below.	5 **valida**, n. sp.

1. H. ischiaca Loew. ♀.—Subænescenti-fusca, antennis nigris, facie punctoque frontali albis, thoracis margine antico pleurisque canis, pedibus ex fusco nigris, coxis anticis, genibus, tibiarum apice tarsorumque basi ex rufo flavis.

Somewhat brassy brown, antennæ black, face and frontal dot white; anterior border of the thorax and pleuræ whitish-gray, legs brownish-black, anterior coxæ, knees, tips of the tibiæ and base of the tarsi reddish-yellow. Long. corp. 0.1. Long. al. 0.11.

Face of medium breadth, slightly dilated below, without keel; the ground color in the middle is more pronounced, giving it rather a brownish aspect; on each side of the face there are four little bristles, one above the other. Palpi yellow, cheeks a little descending. Antennæ entirely black; the bristle in the described specimen has seven rays. Front proportionately broad, dusted with brown; the dot immediately above the antennæ white. Upper

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* The species No. 6 has not been included in this synopsis.—O. S.

side of the thorax dusted with brown; its anterior border, shoulders, lateral border and pleuræ grayish-white with white dust. Scutellum like the upper side of the thorax, only a little more glossy. Abdomen almost blackish-brown, not very shining, but also little dusted. Legs brownish-black; fore coxæ yellow, somewhat infuscated at the base; all the knees brownish-yellow; end of the foremost tibiæ for a little distance and the end of the middle and hindmost as far as the middle, reddish-yellow; fore tarsi only at the base, middle tarsi as far as the middle, the hind tarsi as far as the end of the fourth joint, reddish-yellow. Poisers yellow. Wings a little grayish; second segment of the costal vein nearly half as long again as the third. *Hydrell. ischiaca* is rather similar to the European species: *fulviceps* Stenh., *pilitarsis* Stenh., and *laticeps* Stenh.; from the first it is sufficiently distinguished by its broader face being dusted with whitish; from *pilitarsis* likewise by its broader and whitish-dusted face, and moreover by the pure white color of the frontal dot, the much whiter dust on the shoulders, anterior and lateral borders of the thorax and pleuræ, and finally by the much more extensive pale color of the legs; from *laticeps* by the rather less breadth of the front and face, by the wings showing no whitish appearance in any direction, and by the less extensive pale color of the legs.

Hab. Middle States. (Osten-Sacken.)

2. H. hypoleuca Loew. ♀.—Subænescenti-fusca, antennis nigris, facie punctoque frontali candidis, thoracis margine antico et margine laterali, pleuris ventreque albo-pollinosis, pedibus nigris, metatarsis posticis rufis.

Somewhat brassy-brown, antennæ black, face and frontal dot pure white; anterior and lateral borders of the thorax, pleuræ, and the whole under side of the abdomen dusted with white; legs black, first joint of the hind tarsi red. Long. corp. 0.11. Long. al. 0.12.

Very similar to the European *H. incana* Hal., which Mr. Haliday thinks to be the same as *H. ranunculi*, previously described by him. Face snowy white, not very narrow, underneath broader, slightly keeled in its whole length, beset on each side with three small bristles. Palpi yellow. Cheeks descending but little below the eyes. Antennæ black; antennal bristle in the described specimen with five rays. Front dusted with brown, opaque; anterior border, but especially the shoulder and lateral border dusted with whitish; the foremost beginning of a grayish-white middle line is indistinctly indicated. Pleuræ dusted with whitish. Scutellum dusted with brown and opaque. Upper side of the abdomen only a little dusted, and therefore a little greener and less opaque. The under side and the part of the upper abdominal plates which is turned downwards, covered with white dust; this dust extends to the upper side of the abdomen on the posterior part of each segment. Legs black; first joint of the middle and hind tarsi yellowish-red; first joint of the fore tarsi brown at the base. Poisers yellow. Wings hyaline, rather grayish; the second segment of the costal vein distinctly half as long again as the third. This species differs from *H. incana* by the pure white dust on the anterior and lateral borders of the thorax, as well as on the pleuræ.

Hab. Middle States. (Osten-Sacken.)

3. H. obscuriceps LOEW. ♂.—Subænescenti-fusca, abdomine magis virescente, antennis nigris, facie brunneo-nigrâ, puncto frontali albido, pleuris cinereis, pedibus ex fusco nigris, tarsis posterioribus in basi nigris.

Brassy brown, abdomen more greenish, antennæ black; face brownish-black with a whitish frontal dot; pleuræ ashy gray; legs brownish-black, base of the middle and hind tarsi red. Long. corp. 0.1. Long. al. 0.1.

Face rather narrow above, a little widening underneath, not keeled, of a brownish-black velvety color; on each side there are three small bristles, one above the other. Palpi yellow. Cheeks descending very little below the eyes. Antennæ black, in some directions with a whitish reflection; antennal bristle in the described specimen with six rays. The dot immediately above the antennæ dusted with whitish, but not strikingly so. Front and upper side of the thorax dusted with brown, opaque; anterior and lateral borders of the thorax as well the shoulder without pale dust. Pleuræ pale ashy gray, more brown above. Scutellum of the same color as the upper side of the thorax. Abdomen brownish metallic-green, somewhat glossy; first segment much shortened, second and third of equal length, fourth a little longer, fifth as long as the second and third together, rather broadly truncate at its end, somewhat convex. Legs brownish-black; first joint of the posterior tarsi yellowish-red; the first joint of the foremost tarsi brownish-red only at the base. Poisers yellow. Wings hyaline, a little grayish; the second segment of the costal vein scarcely half as long again as the third. Not possessing any of the few European *Hydrelliæ* with dark colored faces, I cannot point out how *H. obscuriceps* differs from them.

Hab. Middle States. (Osten-Sacken.)

4. H. scapularis Loew. ♀.—Subæneescenti-fusca, antennis nigris, facie ochraceâ, puncto frontali pallidius flavo, interdum albido, thoracis margine antico, humeris pleurisque albo-pollinosis, pedibus nigris, metatarsis posticis rufis.

Brassy-brown; antennæ black, face ochraceous, frontal dot paler yellow, sometimes whitish, anterior border of the thorax, shoulders, and pleuræ dusted with white; legs black, first joint of the hind tarsi red. Long. corp. 0.1. Long. al. 0.12.

Very similar to *H. hypoleuca*, notwithstanding the different color of its face, but certainly not a variation in color of that species. Face a little narrower above than in the latter, quite as broad underneath, thus appearing more dilated below, likewise keeled on its whole length, but more distinctly and a little less obtusely; on each side of it there are three small bristles; its color is dark ochraceous. Antennæ black; bristle with five or six rays. Front dusted with brown, opaque, narrower than in *H. hypoleuca;* the dot immediately above the antennæ is dusted with paler yellow or whitish. Thorax dusted with brown, opaque, the dust not being so thick as to prevent its color from inclining a little to greenish; its outermost anterior border and the shoulders are dusted with whitish; the dust of the pleuræ is of the same color. Upper side of the abdomen greener than that of the thorax, slightly dusted, but also slightly glossy; its under side and the part of the upper abdominal plates which is turned downward, are but thinly dusted with whitish. Legs black; first joint of the posterior tarsi yellowish-red; first joint of the anterior tarsi brown at the base. Poisers yellow. Wings glassy, rather grayish; the second segment of the costal vein more than half as long again as the third.

Hab. United States. (Schaum.)

5. H. valida Loew. ♀.—Inter majores sui generis; glauco-cinerea, tota opaca, facie latiusculâ pallide ochraceâ, antennis pedibusque nigris, basi tarsorum omnium rufâ.

Belonging to the largest species of this genus; greenish-gray, opaque everywhere; face rather broad, pale ochraceous; antennæ and legs black; base of all the tarsi red. Long. corp. 0.12. Long. al. 0.15.

Face rather broad, becoming a little broader upwards, only slightly keeled above, ochraceous, with three small bristles on each side. Palpi yellow. Cheeks slightly descending. Antennæ black; antennal bristle in the described specimen with five rays. Front greenish-gray and opaque in consequence of its grayish dust; the dot above the antennæ has a still duller yellow color than the face and is not conspicuous. Upper side of the thorax and scutellum greenish-gray and opaque from its whitish-gray dust. Pleuræ a little paler greenish-gray. Abdomen grayish-green, opaque, with the fifth segment considerably longer than the fourth. Legs black; tarsi yellowish-red as far as the end of the first joint; also the knees, chiefly those of the hind legs, are of this color. Poisers yellow. Wings relatively to the length of the body, large, hyaline; the veins in the neighborhood of the base pale ochraceous; the second segment of the costal vein about twice as long as the third; the posterior transverse vein does not stand quite perpendicularly to the longitudinal axis of the wing, but is slightly oblique.

Hab. Middle States. (Osten-Sacken.)

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6. H. formosa Loew. ♀. (Translated from Berl. Entom. Zeitschr. 1861, p. 355, by R. Osten-Sacken.)—Atra, thoracis dorso, abdominis apice marginibusque nitidis, fronte, thoracis maculâ laterali permagnâ scutelloque aterrimis, opacis, facie, puncto frontali, pleurarumque vittâ superiore, candidis, femoribus nigris, tibiis tarsisque pallidis, alis cinereo-hyalinis.

Dark, thorax above, tip of the abdomen and its borders shining; front, a large spot on the side of the thorax and scutellum deep black, opaque; the face, a dot on the front and a band on the upper side of the pleuræ shining white, femora black, tibiæ and tarsi pale, wings cinereous-hyaline. Long. corp. 0.057. Long. al. 0.064.

Face moderately convex, not keeled, bright shining white. Cheeks very narrow, black. Front and superior part of occiput deep black, velvety, with a striking shining white frontal mark. Antennæ black, third joint rufous, margined with black above, bristle pectinated with scattered black hairs. Thorax very shining above, on each side a large, deep black, velvety lateral spot.

Scutellum deep black, opaque, with a narrow subcinereous border. Pleuræ black, with a broad, shining white band above. Abdomen black, opaque, the apical half as well as the lateral borders shining. Femora black; tibiæ and tarsi pale yellowish, the upper edge of the former with a white reflection, terminal joint of the latter black. Halteres pale lemon-yellow. Wings cinereous-hyaline, second segment of the costa somewhat longer than the third; third longitudinal vein ending at the very tip of the wing; posterior transverse vein occupying the middle between the basis and the tip of the wing.

Hab. Pennsylvania. (Osten-Sacken.)

Observation.—This species, although very much like *Philhygria picta* Fall. and the allied species, proves to be a true *Hydrellia* on account of the short and very dense pubescence of its eyes.

Gen. II. PHILYGRIA Stenh.

Haliday has employed for this genus the namė *Hydrina*, given by Rob. Desvoidy; but as this name, being derived from *Hydra*, is also used in the family of *Polypi*, it seems more advisable to adopt for it the name *Philygria* of Stenhammar; otherwise this name would not be used at all, the two other genera, which joined with the present, form the genus *Philygria* of Stenhammar, being already possessed of their authorized names, *Hyadina* and *Axysta*. The genus *Philygria*, taken in the present sense, may be characterized in the following manner: Second joint of the antennæ not unguiculated; antennal bristle with a short pubescence. Eyes distinctly hairy, rather rounded, but higher than broad, slightly prominent. Face descending obliquely, narrowed upwards, receding a little towards the mouth, the anterior border of which is a little pointed; on both sides there are distinct bristles. Clypeus undeveloped; mentum rather thickened; cheeks slightly descending. The costal vein attains the fourth longitudinal vein; the posterior transverse vein is rather distant from the border of the wing.

1. P. fuscicornis Loew. Fusco-cinerea, abdomine nigricante, facie flavescente, pedibus nigris, tarsis rufis, in apice fuscis, alis cinerascentibus, cellulâ discoidali et guttâ pone venam transversam posteriorem limpidioribus, venis transversis fusco-limbatis.

Brownish-gray; abdomen blackish, face yellowish; wings gray with the discoidal cell and a drop behind the posterior transverse vein more hyaline; transverse veins margined with blackish-brown. Long. corp. 0.9. Long. al. 0.11.

It has a certain resemblance with *Philygr. femorata* Stenh. and *interrupta* Hal., namely, the form of its face is almost as in the latter, and likewise more yellowish on the middle, whitish on the lateral borders and towards the cheeks. Antennæ blackish, appearing whitish-gray in certain directions, brownish on the inferior border only, when held against the light. Thorax grayish-brown, on its anterior border dusted with whitish-gray; its darker stripes are obsolete, but more visible in the neighborhood of the anterior border, where they extend a little into the brighter gray color. Scutellum as the upper side of the thorax. Pleuræ gray. Abdomen grayish-black, more black towards the end, not glossy. Legs black, tarsi yellowish-red as far as the fourth joint. Wings grayish with a hyaline spot behind the posterior transverse vein and with a rather clearer discoidal cell; the clearer color of the latter is only seen if the light shines through the wing and the wing is looked at in an oblique direction, while the clear spot behind the posterior transverse vein is distinctly seen in every direction. The two transverse veins have only a very narrow and ill-defined dark margin, and the posterior transverse vein is a little less distant from the posterior border of the wing than is usual in this genus; the second longitudinal vein being very long, the second segment of the costal vein is more than twice as long as the third.

Hab. Middle States. (Osten-Sacken.)

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2. P. opposita Loew. ♂. (Translated from Berl. Entom. Zeitschr. 1861, p. 356, by R. Osten-Sacken.)—Ex cinereo fusca, abdomine atro nitido, alarum venis longitudinalibus secundâ, tertiâ et quartâ nigropunctatis, venis transversis late nigro-limbatis.

Cinereous-brown, abdomen black, shining, the second, third and fourth longitudinal veins of the wings spotted with black, transverse veins broadly clouded with black. Long. corp. 0.07—0.09. Long. al. 0.095.

Cinereous-brown, opaque. Ocellar triangle large, concolorous, rather indistinctly separated from the remainder of the front. Two basal joints of the antennæ black, the third black, with the bases and the apical half impurely rufous. Face narrow, black, with a whitish pollen, its middle portion flavescent below. Facial orbitæ of the eyes narrow, with a white reflection. Thorax obscure, cinereous brown above, with very narrow, obsolete darker lines. Pleuræ dark cinereous. Scutellum concolorous with the thorax. Abdomen black, very glossy, a large obscurely cinereous opaque basal spot, not attaining the posterior margin of the second segment. Legs yellowish ferruginous, last joint of tarsi black, base of femora sometimes fuscous. Wings cinereous hyaline, veins black; short stumps of veins clouded with black, proceed from the second, third, and fourth longitudinal veins; the third vein emits four such stumps, all of which, except the last, are opposed to similar stumps on the second vein; the last segment of the fourth vein generally emits two stumps; the ordinary transverse veins are broadly clouded with black. The second segment of the costa is almost twice as long as the third.

Hab. Pennsylvania. Washington. (Osten-Sacken.)

Observation.—Phil. opposita is very like *P. punctato-nervosa* Fall., but distinguished by a more brown color, a more narrowed face, darker legs and antennæ, a larger portion of the abdomen colored with black and by a smaller number of dots on the wings. The facial orbitæ of the eyes, which are much narrowed in *P. opposita*, evidently prove it to be a distinct species.

Note.—Some specimens have *five* stumps on the third vein, opposed to *four* on the second, and more than two stumps on the last segment of the fourth vein. O. S.

3. P. debilis Loew. ♂. (Translated from Berl. Entom. Zeitschr. 1861, p. 356, by R. Osten-Sacken.)—Nigro-cinerea, opaca, antennis totis nigris, fronte atrâ opacâ, triangulo ocellari maximo, nigro-cinereo, ultimo abdominis segmento atro, nitido, pedibus obscuris, genibus, tibiarum anteriorum apice, tarsisque flavescentibus, horum apice nigro, alis cinereo-hyalinis, circa venas transversales infuscatas limpidioribus.

Blackish-cinereous, opaque, antennæ entirely black, front black, opaque, ocellar triangle very large, blackish-cinereous, last segment of the abdomen black, shining, feet obscure, knees, tip of the anterior tibiæ and tarsi yellowish, tip of the latter black, wings cinereous-hyaline, with clearer spaces round the infuscated transverse veins. Long. corp. 0.05. Long. al. 0.064.

Blackish-cinereous, opaque. Front black, with a very narrow white marginal line on each side and the rather large ocellar triangle, blackish-cinereous. Antennæ entirely black. Face yellowish, orbits narrow, whitish. Thorax above with very narrow almost obsolete lines. Abdomen a little darker and less opaque than the thorax, last segment black, smooth. Legs blackish, knees and tip of the anterior tibiæ yellowish, hind tibiæ either altogether blackish, or marked with a narrow, very obsolete pale ring, tarsi yellowish, their last joints blackish. Halteres impure white, knob somewhat darker. Wings cinereo-hyaline, with clearer spaces round the infuscated transverse veins, second costal segment almost twice as long as the third.

Hab. Pennsylvania. (Osten-Sacken.)

Observation.—This species is very like *Philygr. femorata* Stenh., but distinguished by entirely black antennæ, by a less obtuse anterior angle of the ocellar triangle and by a conspicuously longer second costal segment.

III. EPHYDRINA.

The *Ephydrina* are well characterized by their quite naked, prominent, and usually much rounded eyes, by the second joint of their antennæ not unguiculated, and by the middle tibiæ without spinous bristles on their upper side. By the genus *Pelina* they are nearest related to the latter genera of *Hydrellina*. The mentum is much enlarged and swollen in almost all the genera, the oral cavity generally of large width. The genera with less widely opened mouth, as *Pelina* and *Ochthera*, so manifestly bear the chief characters of *Ephydrina*, that no doubt can arise about their systematic position.

The genera of *Ephydrina* hitherto established may be arranged as follows:—

Division 1. Clypeus prominent.

1	The small basal cells of the wings complete.	CANACE *Hal.*
	The small basal cells of the wings wanting.	2
2	Oral cavity proportionally narrow.	3
	Oral cavity exceedingly wide.	4
3	Fore femora not thickened.	PELINA *Hal.*
	Fore femora much thickened.	OCHTHERA *Latr.*
4	Costal vein attaining the third longitudinal vein.	BRACHYDEUTERA *Loew.*
	Costal vein attaining the fourth longitudinal vein.	5

5	Face on each side with a long bristle; lateral border of the mouth without bristles.	PARYDRA *Stenh.*
	Face on each side with several long bristles; lateral border of the mouth with bristles.	HALMOPOTA *Hal.*

Division 2. Clypeus retracted in the oral cavity.

1	Claws almost straight, pulvilli indistinct.	EPHYDRA *Fall.*
	Claws curved, pulvilli distinct.	2
2	Oral border quite bare.	ILYTHEA *Hal.*
	Oral border with bristles.	3
3	Antennal bristle bare.	TICHOMYZA *Macq.*
	Antennal bristle not bare.	4
4	Antennal bristle pubescent.	SCATELLA *R. Desv.*
	Antennal bristle pectinated.	CÆNIA *R. Desv.*

The North American *Ephydrina* known to me belong to the five genera: *Ochthera*, *Brachydeutera*, *Parydra*, *Ephydra*, and *Scatella*.

Gen. I. **OCHTHERA** LATR.

One of the most distinct genera of *Ephydrina*. Front very broad; antennal bristle above, with three rays. Face above moderately broad, with two furrow-like longitudinal impressions approaching each other very much on the middle, then diverging from each other as they descend, and finally continued in a direction parallel to the lateral border of the mouth; on the surface of the face there are some fine and short hairs, but no bristles at all. The face and cheeks descend very deep beneath the large prominent eyes, but are again contracted sensibly towards the opening of the mouth, rendering it smaller than in any of the other genera of *Ephydrina*. Clypeus having the form of a small flat lamella, projecting beyond the anterior border of the mouth. The fore coxæ a little prolonged; the fore femora exceedingly swollen, furrowed on their under side for the reception of the curved tibiæ, which terminate in a spine, and beset with a few small bristles; the first joint of the hind tarsi more or less thickened. The costal vein of the wings reaches to the fourth longitudinal vein; the second segment of the costa is proportionally very long; the posterior transverse vein is very oblique; the third and fourth longitudinal veins converge rather remarkably towards their ends.

Observation.—Th. Say has described a fly as *Ochthera empiformis;* but on a closer consideration of his observations on the anterior femora, the color of the insect, and its small size, it becomes indubitable that he has been deceived relatively to the true characters of the genus *Ochthera*, and it is to be supposed that his *Ochthera empiformis* is an insect belonging to the *Tachydromidæ*.

Synopsis of the Species.

1	Face with deep black furrows and dots.	1 **exsculpta**, n. sp.
	Face without black furrows and dots.	2
2	First joint of the hind tarsi but little swollen.	2 **mantis** *Deg.*
	First joint of the hind tarsi much swollen.	3
3	Tarsi black, face broad.	3 **rapax**, n. sp.
	Tarsi red, face narrow.	4 **tuberculata**, n. sp.

1. O. exsculpta Loew. ♀.—Facies angustissima, lineis punctisque exsculptis ornata; tibiæ anticæ rufæ.

Face exceedingly narrow, with shining-black furrows and impressed black dots; fore tibiæ red. Long. corp. 0.16. Long. al. 0.18.

A readily distinguished species, not quite equalling the three following in size. Front narrower than in all the other known species, almost entirely covered with a large shining spot having the form of a regular trapezium, near which the color is velvety-black at the borders of the eyes and brownish on the anterior corners of the front. Eyes larger and longer than in the other species. Face unusually narrow, dusted with yellow; a shining black furrow runs from the tubercle placed in the middle of the face to the border of the mouth, and has on each side a similar furrow, the under part of which is laterally continued in a parallel direction to the border of the mouth; the lateral parts of the face have some impressed, rather coarse, dots. Clypeus sensibly smaller than in the other species. The fore femora black; the fore tibiæ and tarsi red, the first joint of the latter a little longer and a little less pear-shaped than in the other species. The middle and the hind legs black; the tips of the knees and the tibiæ on their first third red; the first joint of the middle tarsi red as far as the tip, the following joints being so only at the base; the first joint of the hind tarsi is very little swollen, the second and following joints red at the base.

Hab. Cuba. (Poey.)

2. O. mantis Deg. ♂ and ♀.—Pedes nigri, tibiis intermediis non dilatatis, tarsorum intermediorum basi rufâ, metatarso postico modice incrassato.

Legs black; middle tibiæ not enlarged, middle tarsi red at the base, first joint of the hind tarsi only little swollen. Long. corp. 0.24—0.25. Long. al. 0.2.

I am quite unable to distinguish this species, so common in the Middle States of the Union, from the European *Ochth. mantis.* It is true, indeed, that in most American specimens the eyes are a little more distant from each other than in the European; but this difference in some cases disappears entirely; nor do the European specimens altogether agree in this respect. The color of the face is likewise as variable as in the European specimens. As markings, distinguishing this species from the two next ones, which resemble it very much, the following may be noted: The ground color of the legs, in well-colored specimens, is black, only the middle tarsi being red from their base for a very variable extent. The middle tibiæ are considerably narrower than in *Ochth. rapax* and *tuberculata*, and entirely dusted on their anterior side; the first joint of the hind tarsi is very little swollen and rather long.

Hab. Middle States. (Osten-Sacken.)

3. O. tuberculata Loew. ♂.—Pedes nigri, tibiis intermediis subdilatatis, tarsis omnibus obscure rufis, metatarso postico nigro, valde incrassato.

Legs black; middle tibiæ a little enlarged; all the tarsi dark red, the first joint of the hind tarsi black and very much swollen. Long. corp. 0.18. Long. al. 0.17.

Very similar to *Ochth. mantis*, but its face is considerably narrower in its upper part, and the elevation in the middle of it forms more distinctly a small double knob. The middle tibiæ are broader, on their outer edge sharper, and polished on a great part of its anterior side; the knees of the hind legs and all the tarsi brownish-red, the last joint of the latter more brownish; the first joint of the hindmost tarsi black, much swollen.

Hab. Illinois. (Schaum.)

4. O. rapax Loew. ♂.—Pedes nigri, tibiis intermediis subdilatatis, tarsorum intermediorum basi rufâ, metatarso postico valde incrassato.

Legs black, middle tibiæ a little enlarged, middle tarsi red at the base, first joint of the hind tarsi much swollen. Long. corp. 0.16. Long. al. 0.17.

Very similar to *Ochth. tuberculata* in the form of the legs, only the middle tibiæ are of a less equal breadth, but become sensibly broader towards their end. It is also very easily distinguished from *Ochth. tuberculata* by its broader and shorter face showing only an exceedingly flat elevation in the middle. Legs entirely black, only at the base of the first joint of the middle tarsi there is a slight red tinge; the first joint of the hindmost tarsi is still a little shorter and thicker than in *Ochth. mantis*. The wings have rather a more distinct blackish-gray clouding than in the other species. It differs from *Ochth. mantis* by its shorter face, the flatter elevation in the middle of it, and the much shorter and thicker basal joint of its posterior tarsi.

Hab. Carolina. (Zimmermann.)

Gen. II. BRACHYDEUTERA Loew.

Eyes naked, proportionately rather large. Front exceedingly broad. Second joint of the antennæ not unguiculated, as large as the third, the latter rounded; antennal bristle with unusually long rays. Upper part of the face deeply impressed on both sides, and with a keel, resembling a nose, in the middle; the lower part of it is very prominent. The anterior end of the oral margin very much ascending and allowing the convex clypeus to appear. Besides, the whole face is quite bare, with the cheeks descending but very little beneath the eyes. Legs quite bare, rather slender and long; anterior tarsi elongated and exceedingly slender; claws small and delicate, pulvilli rather indistinct. Costal vein of the wing reaching only to the tip of the third longitudinal vein; second longitudinal vein exceedingly short and curved towards the costa like an arch, so that the third segment of the costa is several times longer than the second; the small transverse vein is unusually distant from the base of the wing; the posterior transverse vein is at a little distance from the border of the wing and has a nearly perpendicular position; the last segment of the fourth longitudinal vein is much attenuated.

1. B. dimidiata Loew. ♀.—Superius brunnea, inferius tota candida.

On the upper side brown, on the whole under side white. Long. corp. 0.13—0.14. Long. al. 0.14—17.

Dark brown and entirely opaque on the whole upper side. In well preserved specimens there are, on the upper side of the thorax, two somewhat grayish-brown, approximated, longitudinal lines, which commence at the anterior end of the thorax and stop before reaching the posterior end; between them there is the trace of a fine pale middle line, which becomes more distinct at the posterior end of the thorax and is continued through the scutellum; there are besides two other longitudinal lines, which, being nearer the lateral border and interrupted in the neighborhood of the suture, are not truncated posteriorly and continue indistinctly on the lateral borders of the scutellum. Some specimens show very faint traces of these markings of the thorax. The keel, resembling a nose, on the upper part of the face is dark brown; the remainder of the face together with the cheeks, and the inferior half of the occiput, breast, and pleuræ, as well as the part of the upper abdominal plates which are much turned downwards, are almost silvery white; this color on the last abdominal segments ascends a little to the upper side of the posterior borders. Legs in well-colored individuals blackish-brown, only the apical third of the femora and the first half of the posterior tibiæ being more or less reddish-brown; in less distinctly colored specimens often only the tips of the tibiæ and the tarsi are blackish-brown, all the remainder being brownish-yellow. Wings hyaline with brownish-black veins, sometimes more clouded with grayish in the neighborhood of the costa; the third segment of the costa is twice and a half or three times longer than the second.

Hab. Washington. (Osten-Sacken.)

Observation.—A female sent by Poey from Cuba differs from those received from Baron Osten-Sacken by its brown wing-veins and clay-yellow legs, the tarsi only being of a dark-brown color; but it is only a paler colored specimen of *Brachyd. dimidiata*, which became still paler in the course of time.

Gen. III. **PARYDRA** Stenh.

Form of the body short and stout. Thorax and scutellum very convex. Front very broad. Antennal bristle on the upper side with a short pubescence, which in some species is difficult to perceive; bare towards the end. Face very broad, not so much vaulted as in the true *Ephydræ*, but with a convexity descending more obliquely, on each side with a very characteristic, long, curved, hair-like bristle, beneath which are some shorter hairs, hardly perceptible in some species. Clypeus prominent. Cheeks descending beneath the eyes. Lateral borders of the mouth quite bare. Mentum exceedingly thickened. Legs short and rather clumsy. The small transverse vein of the wings is behind the middle of the discoidal cell, consequently proportionately far from the base of the wing; the posterior transverse vein is not very near the border of the wing, and has a more or less oblique position; the alula is strikingly large.

The species of this genus may be divided into two sections, the first of which comprises thickly hairy species with very convex faces. In North America only naked species, belonging to the second section, have been as yet discovered; they are very similar to the European species of this section; however, they appear to have more plastic differences than these, and to be consequently more easily distinguished from each other. This can be said at least of the four species known to me, none of which is provided with the small appendage of the second longitudinal vein distinguishing some of the European species.

*Synopsis of the Species.**

1	Scutellum with conical warts.	2
	Scutellum without conical warts.	3
2	Scutellum with two warts.	1 **bituberculata**, n. sp.
	Scutellum with four warts.	2 **quadrituberculata**, n. sp.
3	Face nearly perpendicular.	3 **breviceps**, n. sp.
	Face descending obliquely.	4 **paullula**, n. sp.

* The species No. 5 has not been included in this synopsis.—O. S.

1. P. bituberculata Loew. ♂ and ♀.—Ex brunneo æneścens, alis cinereo-hyalinis, venis transversis nigro-limbatis, scutello bituberculato.

Brassy-brown, wings grayish with black margins of the transverse veins; scutellum with two warts. Long. corp. 0.17—0.18. Long. al. 0.17.

Very similar to *Parydra aquila* Fall. in size, form, and color. Face proportionally not very prominent, dusted with brown; the characteristic bristle on each side proportionally slender; upwards near it, but a little more towards the middle of the face, is a rather distinct, impressed spot; the shorter hairs inserted beneath it are hardly perceptible. Orbitæ and cheeks very broad; clypeus very prominent. Antennæ black; antennal bristle hair-like and bare towards the end, stouter about the middle, and with a short pubescence on the upper side. Upper side of the thorax with rather indistinct stripes; the rows of fine punctures, including the stripes, a little more distinct than in the other species. Scutellum at the tip with two not approximated warts, bearing at the end the two usual small bristles of the scutellum. Legs dark, with only the tarsi usually red with black tips; there are individuals with much darker tarsi; the white reflection at the base and tip of the tibiæ not very striking. Wings clouded with grayish, having brownish-black veins and black margins of the transverse veins, in the neighborhood of which the surface of the wings is more distinctly hyaline; the second segment of the costa is nearly twice as long as the third; the ends of the third and fourth longitudinal veins parallel. There are some specimens, the faces of which are dusted with dull whitish; but these certainly belong to the same species.

Hab. Middle States. (Osten-Sacken.)

2. P. quadrituberculata Loew. ♂ and ♀.—Nigro-ænea, alis hyalinis, venis transversis interdum nigro-limbatis, scutello quadrituberculato.

Brassy-black, wings hyaline, transverse veins sometimes margined with blackish; scutellum with four warts. Long. corp. 0.17. Long. al. 0.17.

Similar to the preceding species in color, but a little blacker, not quite equalling it in size. Face generally dusted with white, the dust less frequently quite yellowish on the upper part; the under part of the face projects somewhat less than in *Parydra bituberculata;* the characteristic bristle on each side is very slender and rather short; no impressed spot in its neighborhood; the short small hairs beneath it are scarcely visible; eye-rings and cheeks very broad, but the latter a little narrower than in *Parydr. bituberculata.* Antennæ black; the bristle towards its end excessively slender, being stouter to about its middle, and provided on its upper side with a hardly distinguishable pubescence. Thorax rather indistinctly striped; the two longitudinal lines formed by fine scarcely visible punctures. Scutellum on its tip with two very approximated conical warts, on the tips of which are the two small bristles usually inserted at the end of the scutellum; on each side there is a similar tubercle, ending likewise in a small bristle. Tibiæ and tarsi usually brownish-red, with blackened tips; but there are specimens with the tibiæ quite black and the tarsi brown only at the base, the remainder being quite black; only in recently developed specimens the anterior side of the tibiæ is dusted with white on their whole length; this white dust is generally interrupted behind the middle of the tibiæ. Wings proportionally a little longer than in the other species; the second segment of the costa is about one-half longer than the third; the last segment of the fourth longitudinal vein is unusually long, showing the trace of a slight convergency towards the third longitudinal vein; the fifth longitudinal vein is truncated immediately behind the posterior transverse vein; otherwise the wings are hyaline with a very faint grayish tinge; the veins are brownish-black as far as the base, or frequently brown or brownish-yellow in the neighborhood of the base; sometimes this brownish-yellow color on the costal vein extends to far beyond the middle of the wing; the transverse veins in most specimens are not margined, or show only a trace of blackish-gray clouding; but sometimes they have rather broad blackish margins, the surface of the wing being clearer in their neighborhood; these margins are found particulurly in specimens which have a blacker coloration and almost entirely black legs. The deviations are more remarkable than those occurring in the other species of *Parydra;* but there are various transitions between them, which make it improbable that there is more than one species.

Hab. Middle States. (Osten-Sacken.)

3. P. breviceps Loew. ♀.—Nigro-æuea, facie subperpendiculari, scutello mutico, venis alarum transversis obscure limbatis.

Blackish-aeneous, face rather perpendicular, scutellum without warts; transverse veins of the wing margined with obscure. Long. corp. 0.16. Long. al. 0.16.

Blackish-aeneous. Face dusted with brown, less projecting than in any other *Parydra* known to me, consequently almost quite perpendicular. Orbitæ excessively narrow; the characteristic small bristle on each side of the face is of moderate length and rather slender; beneath it there are a few shorter distinctly visible hairs. Clypeus very narrow; cheeks broad. Antennæ black; the bristle rather slender even at its basal half, hair-like towards its end, with a short but distinct pubescence on its upper side reaching beyond the middle. Thorax rather indistinctly striped; scutellum without tubercles, as is the case in the European species. Femora black. Tibiæ reddish-brown, with a little white reflection at the base and tip, but in the specimen now before me it is too rubbed off to afford any certainty about its extent and nature. Abdomen rather shining, almost with a band of whitish-gray hoar on the posterior border of each segment. Wings rather tinged with grayish, having blackish margins on the transverse veins, the surface of the wings being more hyaline in their neighborhood. The second longitudinal vein is considerably shorter than in the two preceding species, in consequence of which the second segment of the costa is but little longer than the third; the ends of the third and fourth longitudinal veins are parallel; the fifth longitudinal vein curves a little posteriorly at the second half of the discoidal cell.

Hab. Middle States. (Osten-Sacken.)

4. P. paullula Loew. ♀.—Omnium minutissima, facie proclivi, genis angustis.

Very small; face projecting obliquely, cheeks very narrow. Long. corp. 0.06—0.07. Long. al. 0.06—0.07.

A very small species, of which I have only a single somewhat immature specimen, so that I am unable to say more of its colors than that they appear to differ little from those of the other species. Face descending obliquely, and therefore rather projecting with its lower parts; the characteristic bristle on each side rather long and unusually near the border of the mouth. Clypeus and cheeks excessively narrow. Antennæ black, the bristle with fine pubescence to beyond the middle. Scutellum without marginal tubercles; the two small bristles on its tip rather distant from each other. Wings in better colored individuals undoubtedly with much gray clouding and blackish margins of the transverse veins, in the neighborhood of which the surface of the wings is more glossy; the second segment of the costa is only a fifth longer than the third; the ends of the third and fourth longitudinal veins with a trace of a slight divergency; the fifth longitudinal vein extends to the border of the wing.

This species is very similar to *Parydra pusilla* Meig.

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5. P. abbreviata Loew. ♀. (Translated from Berl. Entom. Zeitschr. 1861, p. 357, by R. Osten-Sacken.)—Minuta, antennis tibiisque ferrugineis; alæ infuscatæ guttis aliquot hyalinis distinctissimis ornatæ, segmento costæ tertio secundi longitudinem paulo excedente, venis longitudinalibus tertiâ et quartâ distincte divergentibus.

Small, antennæ and tibiæ ferruginous; wings infuscated, with several hyaline, very distinct dots, third segment of the costa somewhat exceeding the second in length, third and fourth longitudinal veins distinctly diverging. Long. corp. 0.07. Long. al. 0.07.

Olivaceous. Antennæ obscure ferruginous, the two first segments and the upper edge of the third, black; the whole bristle has a short pubescence above. Face moderately sloping, the ordinary bristle on each side is not more approximated to the peristoma than in most of the congeners. Cheeks narrow. Scutellum not tuberculated. Legs black, knees, tibiæ and base of tarsi ferruginous; the whitish pollen, generally extant on the tibiæ of the allied species, is wanting here. Wings rather short, distinctly infuscated, marked with seven rather large hyaline spots; second longitudinal vein with a very short, hardly perceptible appendage; third and fourth veins diverging near the apex; second costal segment almost equal in length to the third.

Hab. Pennsylvania. (Osten-Sacken.)

Gen. IV. **EPHYDRA** Fall.

The hairy, exceedingly vaulted, and very projecting face, the very large opening of the mouth with ciliated border, the concealed clypeus, the nearly straight and rather long claws, and the indistinct pulvilli, characterize the genus *Ephydra*. The bristle of the antennæ is usually pubescent, sometimes almost pectinated with short rays. The genera nearest related to *Ephydra* are *Cœnia* and *Scatella*, the claws of which are curved and the pulvilli distinct. The genus *Tichomyza* is not so near to the genus *Ephydra* and may be easily distinguished from it by its unusually large pulvilli.

1. E. atro-virens Loew. ♂ and ♀.—Obscure viridis, nitida brunneo-pollinosa, antennarum articulo tertio unipili, setâ brevissime puberulâ; ♂ quinto abdominis segmento præcedente breviore, hypopygio brevi, marginem segmenti quarti posteriorem non attingente.

Dark green, glossy, dusted with brown; third joint of the antennæ with a hair, the terminal bristle with very short pubescence; ♂, fifth segment of the abdomen shorter than the fourth, hypopygium short, not reaching the posterior border of the fourth ventral segment. Long. corp. 0.17—0.18. Long. al. 0.17—0.18.

Exceedingly similar to the European *Ephydra micans* Hal., so that I am unable to distinguish the female of the two species, but the much shorter hypopygium of the male characterizes the species as a distinct one. Dark metallic green, very shining, but with brown hoar on the front, thorax, and abdomen, which, distinctly appearing on an oblique inspection of these parts of the body, makes them appear brown and opaque; this brown color is least visible on the abdomen. Antennæ black; third joint on its outer side near the base with a single bristle-shaped hair, which is longer than the joint itself; antennal bristle only with very short pubescence. The front and the sloping space extended between the antennæ and the highest elevation of the face are shining green or bluish-green. Face dusted with white, which, according to the observations made in the allied species, may not be a constant marking; border of the mouth in both sexes with short and rather fine cilia, quite as in *Ephydr. micans* Hal. The ground color of the legs is greenish-black, covered with dust, shining blackish-green on the rubbed parts. Wings clouded with blackish-gray.

Hab. Middle States. (Osten-Sacken.)

Gen. V. SCATELLA Rob. Desv.

This genus contains only smaller and generally not metallic species. Front and face very broad; eyes rounded; face usually very convex, hairy and bristled; border of the mouth ciliated; opening of the mouth wide; clypeus concealed; cheeks moderately broad; mentum swollen. Second joint of the antennæ not unguiculated; antennal bristle with fine, usually very short pubescence. Claws curved, pulvilli distinct. Costal vein of the wings reaching to the tip of the fourth longitudinal vein; the small transverse vein generally almost exactly beneath the tip of the first longitudinal vein; the posterior transverse vein not approaching the border of the wing. The nearest genus is *Cœnia*, differing, however, from *Scatella* by the pectinated bristle of its antennæ.

1. S. favillacea Loew. ♀.—Cinerea, facie albâ, alis cinereo-hyalinis, obsolete quadriguttatis.

Ashy-gray; face white; wings grayish-hyaline with four indistinct clear drops. Long. corp. 0.12—0.13. Long. al. 0.13.

This species resembles most the European *S. sorbillans* Hal., which is identical with *S. argyrostoma* Stenh., but differs from it by its more considerable size, more roughly haired face and gray color of the dust on the posterior part of the cheeks, on the inferior part of the occiput, on the pleuræ and under side of the abdomen, on all which parts it is whitish in that species; *S. favillacea* wants also the clear drop lying beyond the posterior transverse vein in *S. argyrostoma*. The upper side of the whole body is covered with grayish-brown dust, which on the middle of the thorax and on the scutellum does not conceal the shining of the ground color; the large spot lying on the middle of the front is shining greenish. Face very convex, dusted with snowy white, with rather rough hair and the usual row of curved upwards bristles. Opening of the mouth wide, with distinct black cilia on the borders. Antennæ black; the pubescence of the bristle is a little longer and more distinct than in most species of this genus. Upper side of the thorax not distinctly striped. Pleuræ dusted with yellowish-gray, on their superior border with rather brown dust. Under side of the abdomen, femora, and upper side of the tibiæ with gray dust. Wings clouded with grayish, having black veins; of the five clear drops, peculiar to so many species of this genus, that lying beyond the posterior transverse vein is entirely wanting, and the remaining are rather indistinct; the second segment of the costa is at least four times as long as the third; the third and fourth longitudinal veins are parallel towards their ends.

Hab. Middle States. (Osten-Sacken.)

2. S. lugens Loew. ♂ and ♀.—Nigra; alæ nigricantes, guttis hyalinis quinque in disco duabusque obsoletioribus in apice pictæ.

Black; wings blackish with five clear drops in the middle and two more indistinct ones towards the tip. Long. corp. 0.11. Long. al. 0.13.

It differs from the European *Scat. stagnalis* only by somewhat more acute wings, its somewhat less convex face, and the stripes of the thorax being a little more distinct; perhaps on examining a larger number of specimens it may prove to be only a variety of it. Black; face with brownish-gray dust, rather convex, only a little impressed beneath each antenna, hairy and bristled, with distinct black cilia on the border of the mouth. Antennæ black; the bristle with an excessively short, but yet distinct pubescence. Cheeks exceedingly narrow. Front dusted with grayish-brown, the spot on the middle of it a little glittering. Upper side of the thorax likewise dusted with brown, but not without all gloss, with two distinct whitish-gray longitudinal stripes, but little distant from each other and beginning on the anterior border, but not reaching nearly to the posterior border; besides there are two short lateral stripes of the same color, beginning at the shoulder-corner. Scutellum of the color of the upper side of the thorax, only a little more glossy. Abdomen black, rather glossy towards the end: the fifth abdominal segment of the male is almost twice as long as the fourth. Legs entirely black. Wings clouded with black, having five glassy drops on the middle, in the usual position; besides there is an obsolete spot, forming an indistinct clear drop near the border of the wing between the tip of the second and third longitudinal veins, and another still less perceptible spot in the cloudy color beyond the tip of the third longitudinal vein.

Hab. Middle States. (Osten-Sacken).

3. S. obsoleta Loew. ♀. (Translated from Berl. Entom. Zeitschr. 1861, p. 358, by R. Osten-Sacken.)—Opaca, capite toto, scutello pleurisque ex flavo, pectore et abdomine ex cano cinereis, antennis pedibusque nigris; alæ hyalinæ, dilute cinerascentes, guttis limpidioribus quinque obsoletissimis.

Opaque, the whole head, scutellum and pleuræ yellowish-cinereous, pectus and abdomen hoary-cinereous, antennæ and feet black; wings hyaline, with a pale cinereous tinge; five almost obsolete clear spots. Long. corp. 0.07. Long. al. 0.09.

Head altogether yellowish-cinereous, antennæ black, face very vaulted,* peristoma ciliated with moderate hairs. Thorax concolorous with the head, pectus subglaucous. Scutellum yellowish-cinereous. Abdomen hoary-cinereous, subglaucous, opaque. Legs altogether black, slightly pollinose with white. Halteres impure yellow, stem brown. Wings hyaline, tinged with very pale cinereous, marked with five clear very obsolete spots; transverse veins not infuscated; second costal segment more than thrice longer than the third.

Hab. Washington. (Osten-Sacken.)

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* The original has *fornicatus*, which means forming a rounded arch with an empty space below.—O. S.

V.

ON THE NORTH AMERICAN CECIDOMYIDAE.

BY BARON R. OSTEN-SACKEN.

It is a peculiarity of the family of *Cecidomyidæ* that its natural history has always been studied in close connection with its classification. This is owing chiefly to the fact that *the gall*, the produce of the insect in its first stage of life, is generally a more striking object in nature than the insect itself. The latter small, tiny, difficult to preserve on account of their extreme delicacy, still more difficult to distinguish from their congeners on account of the uniformity of their appearance and coloring, would afford a very unsatisfactory object of study, unless in connection with the varied deformations which their larvæ produce on plants. The study of this family, different in this respect from most of the other families of insects, cannot be prosecuted apart from the observation of living nature, and for this very reason will always be a monopoly of the naturalist so situated as to afford such observations.

The aim of the present paper is to direct the attention of American entomologists to this most interesting subject, by giving an account of the observations already made on the North American *Cecidomyidæ*, as well as a general introduction to the study of the habits and the classification of this family. The latter has been extracted chiefly from the two following admirable monographs:—

Loew, Dr. H. Dipterologische Beiträge, Part fourth, Posen, 1850, with a plate. (Contains a monograph of the European *Cecidomyidæ*.)

Winnertz, J. Beitrag zu einer Monographie der Gallmücken. In the Linnæa entomologica, Vol. VIII, Berlin, 1853, with four plates.

I. *On the classification of the* Cecidomyidæ.

In the sketch of a systematical distribution of the Diptera, given by Prof. H. Loew in this volume, he has mentioned the difficulties attending a sharp definition of this family, and has shown that it may be naturally divided in two sections.

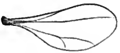
The species embraced in the first section, which he calls *Cecidomyina*, have four longitudinal veins on the wings, the last two of which often coalesce in the beginning of their course, forming a more or less distinct fork. They have no ocelli, and the first joint of their tarsi is much shortened.

The second section, which Prof. Loew calls *Anaretina*, has one longitudinal vein more, which is inserted between the second and third veins of the first section; this supplementary vein is simple in *Campylomyza* and furcate in all the other genera. The first tarsal joint is not shortened, and in all the genera, with the exception of *Cecidogona*, there are distinct ocelli.

The first section, which contains all the gall-producing *Cecidomyidæ* at present known, comprises two genera of Meigen and a third genus, discovered by Mr. Winnertz, and of which but a single species is described. These three genera are easily distinguished by the neuration of their wings, which are always pubescent, and may be characterized as follows:—

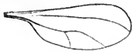
Cecidomyia Meig. Three or four longitudinal veins; in the first case the third vein is forked, thus representing the third and fourth veins, which are coalescent in the greater part of their extent (figs. 1, 2, and 4; in some rare cases a branch of this fork or the whole fork becomes obsolete, as in fig. 3); in the second case all the four veins are simple (fig. 5). Surface of the wings hairy; margins with long cilia. Antennæ long, moniliform or cylindrical, generally verticillate, seldom without verticils, from 13 to 36-jointed.

Fig. 1.



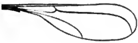
Cecidomyia.

Fig. 2.



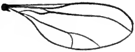
Diplosis.

Fig. 3.



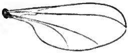
Colpodia.

Fig. 4.



Epidosis.

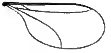
Fig. 5.



Asynapta.

Spaniocera Winn. Three longitudinal veins, which are all simple (not forked); the first close by the costa, the second at some distance from it, but reaching the margin of the wing before its tip (fig. 6). Hairs on the surface of the wing scaly. Antennæ filiform, 13-jointed, joints elongated, cylindrical, with a short pubescence and without verticils.

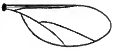
Fig. 6.



Spaniocera.

Lasioptera Meig. Three longitudinal veins, the first and second of which run very near the costa and are so closely approximated as to be hardly discernible (fig. 7). Wings rather short and broad. Antennæ from 16 to 26-jointed; joints subglobular, sessile, with short verticils. (The sub-genus *Clinorhyncha* Lw. has been formed of the *Lasiopteræ*, having the mouth prolonged in a rostrum.)

Fig. 7.



Lasioptera.

The considerable number of species contained in the genus *Cecidomyia* Meig. and the great variety of their structure have made a subdivision necessary. The following tabular arrangement of the sub-genera now adopted has been extracted, with a few modifications, from Mr. Winnertz's work, although the subdivision itself is chiefly due to Mr. Loew.

CECIDOMYIA Meig.

I. Wings with three longitudinal veins, the third either forming a fork (figs. 1, 2, and 4), or becoming more or less obsolete towards the tip (fig. 3).*

A. Cross-vein placed between the root and the tip of the first longitudinal vein, as in figs. 1—3: (in this section the cross-vein is frequently almost obsolete.)

Cecidomyia Loew. The second longitudinal vein reaches the margin of the wing a little *before* its tip (although in most cases this distance is very short, as in fig. 1). Generally *the same number of joints in the antennæ of the ♂ and ♀*; joints either pedicelled or sessile (sometimes pedicelled in the ♂ and sessile in the ♀; sometimes of the same structure, pedicelled or sessile, in both sexes).

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* In examining the wings of the Cecidomyiæ, care must be taken not to mistake for a vein a longitudinal fold which generally exists between the second and third longitudinal veins.

Diplosis Loew. The second longitudinal vein reaches the margin of the wing *at* or *beyond* its tip (fig. 2). *Antennæ of the male* 26 (2 + 24) *jointed*, sometimes with one rudimental joint more; joints pedicelled, simple joints alternating with double ones (Tab. I, f. 11 and 12), seldom all joints simple. *Antennæ of the* ♀ 14 (2 + 12) *jointed*, sometimes with one rudimental joint more; joints pedicelled, cylindrical.

Asphondylia Lw. The second longitudinal vein reaches the margin of the wing a little *beyond* its tip (as in fig. 2). Antennæ of both sexes with the same number of joints; the latter cylindrical, sessile, with a short pubescence and *without verticils.* (A single European species is known.)

Hormomyia Lw. The second longitudinal vein reaches the margin of the wing either *at* or *beyond* the tip. *Thorax more or less gibbose, frequently extending over the head in the form of a hood.* Joints of the ♂ antennæ pedicelled; those of the ♀ pedicelled or sessile.

Colpodia Winn. The second longitudinal vein forms a curve before the cross-vein and joins the margin a little beyond the tip of the wing (fig. 3). Cross-vein rather large, oblique. (A single European species is known in the female sex only; the joints of its antennæ are pedicelled. This sub-genus, which is unknown to me, must be very difficult to distinguish from *Epidosis.*)

B. Cross-vein very oblique, originating at the root of the first longitudinal vein (fig. 4).*

Dirhiza Lw. Second longitudinal vein hardly undulating before the cross-vein; joints of the antennæ sessile or almost sessile in both sexes. (A single species is known.)

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* The sections A and B, as defined by MM. Loew and Winnertz, seem to be somewhat difficult to distinguish. According to the latter, the cross vein in the section B almost assumes the appearance of an intercalary longitudinal vein; it begins at the root of the first longitudinal vein, runs, although very indistinct, alongside of it and then turns obliquely towards the second longitudinal vein, which thus almost appears to be its continuation, or, in other words, to have two roots.

Epidosis Lw. Second longitudinal vein sinuose before the cross-vein (fig. 4); joints of the antennæ pedicelled in both sexes; their number variable.

II. Wings with four longitudinal veins (fig. 5).

Asynapta Lw. The cross-vein is sometimes like that in section A, and then the second longitudinal vein is not sinuated; sometimes as in section B; then the second longitudinal vein is sinuated, like in *Epidosis* (fig. 5); in this case also the collare is a little prolonged.

The classification of the section *Anaretina* Loew, is very imperfect; almost nothing is known about their habits, and even their position in the system is doubtful. Mr. Loew considers them, at least provisionally, as a sub-section of the *Cecidomyidæ*, whereas Mr. Winnertz prefers to isolate them as a distinct family, placed between the *Cecidomyidæ* and the *Mycetophilidæ*, and having many points of relationship to both.

Following the authority of Mr. Loew in this volume (p. 7), I will confine myself to the enumeration of the genera which he refers to this section, adding only short sketches of their characters as I find them in the former writers.

I. Ocelli extant;
  Wings bare or almost bare; third longitudinal vein forked, the two following veins simple.
    Antennæ 16-jointed; ♂ verticillate, joints pedicelled; ♀ pubescent, joints sessile; branches of the fork of the 3d longitudinal vein very arcuated at base (fig. 8, wing). ZYGONEURA *Meig.*
    Antennæ 9-jointed, short, slightly pubescent; joints subsessile, subglobose (fig. 9, wing). ANARETE *Hal.*
  Wings pubescent;
    Third longitudinal vein forked.
      The upper branch of the fork forms a double curve, almost in the shape of an S; (see Plate I, fig. 13.) TRITOZYGA *Lw.*
      The upper branch of the fork forms a single smooth curve; ♂ antennæ 16-jointed, verticillate, joints pedicelled; ♀ antennæ 10-jointed, pilose, joints moniliform (fig. 10, wing). CATOCHA *Hal.*

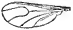
Fourth longitudinal vein forked; antennæ 11–20-jointed; ♂ moniliform, pilose; joints pedicelled; ♀ submoniliform, joints sessile, pubescent (fig. 11, wing). CAMPYLOMYZA *Meig.*

II. Ocelli wanting; third longitudinal vein forked; first longitudinal vein very short; wings pubescent; antennæ ♂ moniliform, verticillate; ♀ submoniliform, pubescent.

Antennæ 16-jointed (fig. 12, wing). LESTREMIA *Macq.*

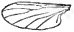
Antennæ 11-jointed. CECIDOGONA *Lw.*

Fig. 8.



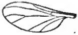
Zygoneura.

Fig. 9.



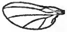
Anarete.

Fig. 10.



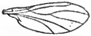
Catocha.

Fig. 11.



Campylomyza.

Fig. 12.



Lestremia.

For further details as well as for the references, see Walker, Diptera Britannica, Vol. III, which also contains beautiful figures of all the genera. As to the new genus *Tritozyga* Lw., formed on an American species, Mr. Loew thus characterizes it in a manuscript note of his:—

"The whole structure of its body shows the nearest relation to *Campylomyza;* the form of the legs and wings is as in that genus; the wings (Tab. I, fig. 13) have the same short pubescence and cilia, and the three ocelli are just as distinct. The differences are the following. 1. The vein, which in the second section of *Cecidomyidæ* is added to the number of the veins of the first section, is not simple, but forked, in the new genus, and therefore approaches in some measure the genus *Anarete;* 2. The very thick longitudinal vein is not forked as in *Campylomyza*, but simple. The new genus cannot be confounded with *Anarete*, the species of which have a much more slender structure, a very elongated first joint of the tarsi and the third longitudinal vein of the wing bipartite as far as the base. From *Lestremia* and *Cecidogona* it differs in quite a similar manner, and besides by the presence of ocelli, which are wanting in both genera. The antennæ are mutilated in the single specimen which I have before me (a male from the District of Columbia), therefore I can say nothing of the number of their joints; their structure is as in most *Campylomyzæ.* The number of the joints of the antennæ being of a higher value, among the Gall-gnats, for the distinction of species than for that of genera, since almost every genus comprises species with very different numbers of joints of the antennæ, I abstain from giving a name to the species known to me so incompletely; as to the genus, which can never be mistaken, I propose for it the name of *Tritozyga.*"

II. *On the habits of the* CECIDOMYIDÆ.

The food of the larvæ of *Cecidomyia* is of a vegetable character. A few apparent exceptions will be mentioned below. They furthermore seem to live in preference on *living* plants; nevertheless several species of the subgenera *Epidosis* and *Diplosis,* have been reared by Mr. Winnertz from decaying wood; *Cec. fuscicollis* Meig. (?) has been reared by Bouché from decaying bulbs of tulips and hyacinths. (Instances like that of *Cec. bicolor* Bouché, found in dung during winter, must be received with caution, as the larvæ may have gone there for transformation only.) Although the majority of these larvæ attack the soft and green parts of plants, some of them live under the bark of trees, in the cones of pines (*Cec. strobi* Kalt.) or in fungi (*Diplosis polypori* Wz., *Asynapta lugubris* Wz., etc.)

Again, most of the larvæ are monophagous, that is, each species lives exclusively on a certain species of plant, or, at least on closely allied plants; Mr. Winnertz remarks that even those found under the bark of trees follow the same rule. Exceptions are *Cec. sisymbrii* Schr., which, according to Mr. Winnertz, inhabits in May and June a gall on *Berberis vulgaris,* and from June till November a somewhat different gall on *Nasturtium sylvestre* (Winn. l. c. p. 209 and 231); *Cecid. arcuata* Wz., has been found in the pappus of different syngenesists, in decaying wood and fungi. Besides these, there is a class of larvæ which live as guests or parasites in galls formed by other *Cecidomyiæ* (*Cec. acrophila* Wz. and *pavida* Wz. live socially in the deformed buds of *Fraxinus excelsior; Diplosis socialis* Wz. inhabits the gall of *Lasioptera rubi; Dipl. tibialis* Wz., has been reared from the same gall with *Cec. salicina* Schr., etc.); or by *Acari* (*Cec. peregrina* Wz., and similar cases, observed by Loew.) Some even live in the society of *Aphides.* According to Mr. Winnertz the larvæ of the subgenus *Diplosis* principally, share these parasitical habits; even those living under the bark of trees or in fungi are seldom found alone, but for the most part in the society of other larvæ (Winn. l. c. p. 206). Thus, the larva of a species of *Diplosis* has been found in a stem of *Sarothrium scoparium*, together with larvæ of *Hylesinus* and *Apion*.

Among the larvæ with an exceptional mode of life, those should be mentioned which live *on the surface* of the plant, as that, observed by Mr. Loew on the leaves of *Veronica Beccabunga*, or those of *Diplosis ceomatis* Wz., and *D. coniophaga* Wz. found on the leaves of a rose-bush overgrown with the fungus *Ceoma miniatum*, on which they feed. The American species, probably also a *Diplosis*, which I have called *Cec. glutinosa*, and which will be described below, has a similar mode of existence on the surface of hickory leaves.

The greater number of larvæ penetrate inside of the plant, so as to be concealed from view during their development. Their presence is generally indicated on the outside of the plant by some deformation. Every part of the plant, from the root to the flower and the fruit, is liable to such attacks. But each species of *Cecidomyia* always attacks the same part of the plant, and deforms it in the same way. (Exceptions seem to be rare; *Cec. tremulæ* Wz. has been reared from two galls of different shape, both found on the poplar; the insects differed only in size).

The deformations thus produced are very numerous, and several unsuccessful attempts have been made to classify them according to the nature of their origin and their shape. At one extreme of the series is the true gall, a vegetable growth of constant and definite form, attached to the plant by a very small portion of its surface and not otherwise deforming that part of the plant (of this class are, for instance, the numerous galls, described below, on the leaves of the hickories); at the other extreme is the simple deformation, folding of a leaf, swelling of a leaf-rib, arrest of the growth of a bud or a stalk, etc.

The egg of *Cecidomyia* is elongated, rounded at both ends, orange-yellow, or whitish. The time within which the larva is hatched is very different, and depends on the state of the weather; in a great heat, the hatching sometimes takes place within a few hours; generally a few days are required. Mr. Loew supposes, however, that the species having but one yearly generation remain much longer in the state of eggs.

When first hatched, the larva is colorless, transparent, with a translucent green, yellowish or red stomach; later in life it assumes different shades of red (orange, pinkish, cochenille-red) or becomes yellow or whitish; the color of the same species may also somewhat change with age. All these larvæ have the extraordinary number of fourteen joints, thus affording an apparent exception from all other larvæ of insects, which, as a general rule, have thirteen joints. The supernumerary fourteenth joint is placed between the head and the first thoracic (stigma-bearing) segment. It may be considered either as a part of the head, or as a prolongation of the first thoracic segment. Number and position of the stigmata are normal; one pair on the first thoracic segment, and eight pairs on the first eight abdominal segments, so that the ninth or last segment bears none. Sometimes the last pair of stigmata is removed from its usual lateral position, more towards the middle of the segment. In one case (*Cec. pini* Deg. and the American *C. pini inopis*) this last pair is placed apparently on the *last* segment; but this segment is in reality the eighth, the ninth segment being in this larva unusually small and concealed under the eighth. The stigmata are horny, more or less nipple-shaped projections.

The skin of most larvæ appears finely chagreened under a strong magnifying power; in some cases it is perfectly smooth. The dorsal segments of *Cec. sarothamni* Lw., *C. genistæ* Lw., etc. are uneven; those of *C. craccæ* Lw., *C. quercus* Lw., *C. fuscicollis* Bouché, etc. are furnished with bristles or sparse hairs; those of *C. entomophila* Perris with hairs arranged in regular rows; those of *Cecid. pini* Degeer, and of two larvæ which I found in this country (*Cec. pini inopis* O. S. and *Cec. glutinosa*, nov. sp.), have rows of fleshy, setiferous caruncles along the back. (It is to be noticed here that both Degeer and Dufour, in describing such larvæ, mistook the back for the venter, and described these caruncles as *pseudopods*. See Deg. Mém. VI, Tab. XXVI, fig. 9—19, and Dufour, Ann. Soc. Ent. de Fr., 1838, p. 293).

The last abdominal segment is smooth and rounded, or furnished with two setiferous tubercles (*Cec. pini*), sometimes uneven and bristly, or excavated, or armed with a pair of horny processes, frequently curved upwards. Dufour saw a larva use these processes for leaping.

The structure of the head and of the organs of the mouth is but imperfectly known. What Mr. Ratzeburg saw (see his paper in Wiegmann's Archiv, vol. vii. p. 233, with a plate) and what I have found confirmed by my own observations, may be reduced to the following: The horny parts of the head consist of a ring with two processes extended backwards; a soft, fleshy swelling which protrudes through this ring is taken by Ratzeburg for the labium; two openings in the upper part of the ring emit a pair of two-jointed organs which this author and L. Dufour believed to be palpi, but which I would rather consider as rudimental antennæ, especially on account of their position on the upper side of the head. (Laboulbène and Perris entertained the same view.)

On the under side of the body, at the juncture of the first thoracic segment with the supernumerary (14th) segment, there is a horny, more or less elongated piece, projecting with its anterior part, whereas its posterior end is concealed under the skin of the first thoracic segment, and more or less translucent. This organ, the use or the homology of which is unknown, is peculiar to the larvæ of *Cecidomyia*, and seems to be seldom wanting. (I found under the bark of a tree a full-grown larva which, for its structure I believe to be a *Cecidomyia*, although it showed no trace of this breastbone.) It may be that this organ is used for locomotion, although I hardly would consider it as homologous to the pseudopods of the larvæ of *Chironomus* and *Ceratopogon*. If the supplementary (14th) segment be considered as a part of the head, this breastbone might be taken for the mentum, in analogy to the horny mentum of the larvæ of the *Tipulariæ*. The form of this organ is variable in different species; sometimes it ends anteriorly in two points, with an excavation between them; sometimes in one elongated point; or it is serrated, etc.

The remaining part of the under side of the body sometimes shows other organs of locomotion. The larva of *Cec. entomophila*, according to Perris, has three slender, elongated, pointed, subcorneous, approximated projections in the middle of every ventral segment. *Cec. fuscicollis* Bouché (Bouché, Naturg. der Ins. p. 25), has a pair of elongated, pointed pseudopods under each thoracic segment, and three such pseudopods under each abdominal segment. Bouché's figure of the latter closely resembles Perry's figure of the pseudopods of *Cec. entomophila*.

The motions of the larvæ, except those few, living on the surface of the leaves, are generally slow; but those which change their abode before assuming the pupa state become very active about that period. Winnertz observed an extraordinary activity in some such larvæ after a thunder storm; they left their hiding-places under ground, and crawled about restlessly for some time; they did the same after every thunder storm, some of them even two months after having left their galls.

The larvæ of several species, for instance, *Cec. loti*, *Cec. pisi*, and *Cecid. rumicis*, have the power of leaping. Mr. Loew remarks that all such larvæ belong to the sub-genus *Diplosis*. *Cec. populi* Duf. performed its leaps by straining the horny hooks at the tip of its abdomen against the under side of the thoracic segments. (Dufour, Ann. Sc. Nat., 2e sér. XVI, p. 257.)

"The want of horny organs of mastication," says Mr. Winnertz, "authorizes the supposition that a lesion of the plant does not take place; it is much more probable that the larva has the power of producing in the plant some peculiar irritation, which causes an overflow of the sap necessary for its food. How little the larva requires for its support is evident from the circumstance that it attains its full growth and development in a gall just large enough to inclose it, a gall apparently hermetically closed, for the most part with hard walls, which do not show the least sign of internal lesion. It seems even as if a certain amount of moisture alone was sufficient to sustain these larvæ, especially when a great number of them live socially in the same gall (from ten to fifteen larvæ in the pea-sized bud of *Cardamine pratensis;* from fifty to sixty in another kind of gall, etc.). Another proof of the small quantity of nourishment required by these larvæ is, that no excrements are to be found in their place of abode."

"The only exception known to me of this extreme frugality," says the same author, "are the larvæ of two species which live on the leaves of the white rose, attacked by the fungus *Ceoma miniatum.* These larvæ not only lick the sap exuding at the bottom of the heaps of spores, but they also greedily consume the spores themselves, and their intestinal canal is always filled with them."

The observation of Vallot (Mém. de Dijon, 1827, p. 95), that a larva of *Cecidomyia* (*C. acarivora*) found on the surface of the leaves of *Chelidonium* feeds by sucking *Acari*, as yet requires confirmation. Winnertz saw *Cecidomyia*-larvæ living as guests in deformations produced by *Acari*, greedily lick their hosts, but he never found in such galls an empty skin of an *Acarus*. As to the larvæ of *Cecidomyia* inhabiting galls, produced by other species of the same genus, it is a question, according to Winnertz, whether they take the same food with their hosts, or live on their excrements. Perris (Mém. de Lille, X, p. 274, with figures) found *Cecid. entomophila* in an insect-box, living on the excrements of the minute *Acari* abounding in such boxes; he compares them, apparently with good reason, with the larvæ of *Cecidomyia* found under the bark of trees, among the excrements of the xylophagous insects. These larvæ underwent their transformation in the corners of the box.

It is very probable that the larvæ of *Cecidomyia*, like most of the dipterous larvæ, do not undergo several moultings. I do not find any mention about it in the authors. Only Dr. Harris states that *C. tritici* casts off its skin before going under ground for transformation.

Before assuming the pupa state, some larvæ of *Cecidomyia* leave their galls and abscond themselves under ground, under dry leaves or moss, or under the bark of trees. Other larvæ, on the contrary, undergo their transformation within their gall.* In both cases the pupæ are frequently, although not always, inclosed in a cocoon. Winnertz positively denies that the larvæ spin this cocoon; according to his observation, the latter is, so to say, *exuded* by the larva. He found that larvæ which had fastened themselves to a leaf, were encircled within twenty-four hours by a white halo, consisting of tiny thread-like particles, which seemed to grow somewhat like crystal-needles; the larva during this time remained perfectly motionless. The cocoon is perfected within a few days, and even then, under a strong magnifying power, no genuine thread is perceptible.

The mode in which the pupa state is assumed has been described by Dr. Harris in a posthumous paper published in the Proceedings of the Boston Soc. of Nat. Hist., 1860, p. 179. "The approaching change is marked by an alteration of the color of the anterior segments of the larva, which (in the case of *Cecid. salicis* Fitch) from orange become red and shining, as if distended by blood. Soon afterwards, rudimentary legs, wings, and antennæ begin, as it were, to bud and put forth, and rapidly grow to their full pupal dimensions, and thus the transformation to the pupa is completed." The peculiarity of this process is, that the transformation is undergone *without shedding the larva skin*, and, as the same observation has been repeated by Dr. Harris on the larvæ of *C. destructor* Say and *C. tritici* Kirby, it is very probable that it applies to all the larvæ of the genus. I do not find this fact mentioned in the European authors.

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* The larva of *Cecid. terminalis* Lw., according to Winnertz, varies in its habits. It sometimes goes under ground, and sometimes transforms within the willow leaves deformed by it.

Instead of a cocoon, the pupa of *Cec. destructor* Say is inclosed in an oblong, brown case, which is nothing but its own hardened pupa-skin. "The larva of this insect, says Dr. Harris (*l. c.*), when it has come to its growth, remains fixed and motionless on the culm of the wheat. Its body contracts and soon takes the form and color of a flax-seed. While this change is going on externally, the body of the insect gradually cleaves from its outer dry and brownish skin. When this is carefully opened, the included insect will be seen to be still in the larva state. It does not change its condition until a few days before it discloses the winged insect," etc.

Cecid. graminicola Kalt. and another *Cecidomyia*, mentioned by Dr. Fitch as forming an imbricated gall on *Agrostis lateriflora*, undergo a similar kind of transformation, their pupæ being inclosed in the dry larva-skin.

However different the mode of transformation of *Cecid. pini* Deg., *C. pini maritimæ* Duf., and *Cec. pini inopis* O. S. may appear, the pupæ of which are inclosed within a cocoon of resin, it is in perfect analogy with the preceding instances. The process by which the cocoon is formed is exactly the same as that described above by Dr. Harris. The larva of the American species *C. pini inopis* O. S. observed by me in the environs of Washington, fastens itself to a pine leaf and remains motionless until the resinous substance which it exudes abundantly, begins to harden; the larva then gradually frees itself from the contact of the cocoon-like case thus formed. It is very probable that this cocoon is nothing but the outer larva-skin, saturated with resin.

The pupæ of *Cecidomyiæ* show a close resemblance to those of the *Tipulæ fungicolæ*, especially those of *Sciara*. As in the latter genus, the bases of the antennæ are often produced in points; these *frontal projections* are sometimes long, approximated, and resemble horns (*Cec. sarothamni*, see Winnertz, l. c. Tab. I, f. 6, or *Cec. verbasci* Dufour, Ann. Sc. Nat., 3e sér., Vol. IV, p. 5–24, with figures, 1845); in other cases they are smaller and at some distance from each other (*Cec. salicina*, *C. veronicæ*, etc., see Wz., l. c. f. 3, 4). Behind these horns, two pairs of bristle-like processes may be observed in most pupæ. The first pair is also on the head, close by the horns, the second on the thorax. Both vary in size and strength in different species. The second, thoracic pair, has been taken by some authors for a spiracle. These projections and horns, especially the frontal ones, aid the pupa in working its way through the gall or from underground, before entering its last stage of existence. The dorsal segments of the abdomen are, for the same purpose, frequently rough with spines. The tip of the abdomen is sometimes smooth; in other instances it bears a few bristles.

After the exclusion of the perfect insect, the pupa-skin remains frequently hanging on the outside of the gall.

Some species of *Cecidomyia* have only one, others more than one yearly generation. The summer generation of the latter kind remain but a short time in the pupa state; the winter generation much longer.

The larvæ of *Lasioptera* resemble those of *Cecidomyia* in their structure as well as in their habits. They frequently have the same reddish color and the peculiar breast-bone. *L. rubi* Heeger and the N. American *L. vitis* O. S. produce swellings in the stem of the plants which they inhabit. *L. pusilla* Heeger forms galls on the leaves of *Sonchus*, *L. cerris* Kollar on those of the oak (*Quercus cerris*).

III. *On the North American* CECIDOMYIÆ *hitherto observed and their galls.*

The species of N. A. *Cecidomyiæ* at present known, may be distributed into three categories, according to the extent of our knowledge concerning them. About the species of the first category, nothing but the description of the perfect insect is extant, its habits remaining unknown; as to those of the second category we are acquainted with the first stages of their existence, especially with the deformations they produce, without knowing the perfect insect; finally, to the third category belong those, the habits of which, as well as the perfect insect, are described.

The following is a synopsis of the species recorded by previous authors, as well as of those mentioned in this paper:—

I. Perfect insect described, habits unknown.

C. ornata Say, Long's Exped. App. p. 357. Wied. Auss. Zw. I, 22, 2.
C. caliptera Fitch.
C. cerealis Fitch.
C. tergata Fitch.
C. thoracica Fitch.
} Dr. A. Fitch, Essay on the Wheat-fly, etc.
C. spongivora Walk. List of Dipt. Brit. Mus. I, 30.
Campylomyza scutellata Say, Journ. Acad. Phil. III, 17, 1. Wied. Auss. Zw. I, 22, 1.
Tritozyga, sp. Lw. (see p. 178).
Diplosis maccus Lw. The following note on this new species was furnished by Mr. Loew:—

"Gall-gnats cannot be recognizably described from single dried specimens, unless they are distinguished by some striking peculiarities. I feel no temptation at all to describe species which have no such peculiarities, and allow myself an exception only with the following *Diplosis* on account of its remarkable beauty.

D. maccus Loew. ♂ and ♀. (Tab. I, figs. 11 and 12.)—Flavida, thorace fusco-vittato, antennarum articulis nigris et pallidis alternantibus, alis violaceo-maculatis, tibiis tarsisque nigro-annulatis.

Yellowish, thorax with fuscescent stripes; the joints of the antennæ alternately black and whitish; wings with violet-blue spots; tibiæ and tarsi annulated with black. Long. corp. 0.08. Long. al. 0.11.

Yellowish; the joints of the antennæ alternately black and yellowish-white, the simple joints being black, the double joints yellowish-white; also the hairs of the black joints are black, and those of the light ones light. Thorax with three brown longitudinal stripes coalescing anteriorly, the intermediate one reaching only to the middle of the thorax, the lateral ones running as far as its posterior margin. Abdomen without dark bands. Coxæ yellowish. Fore and middle femora black on the upper side and tips, the outermost extremity of the tip being yellowish; hind femora with a black line not reaching far beyond the middle, and with the tips black. Tibiæ black; anterior ones with a very broad yellowish ring beyond the middle, the hind ones with such a ring at their base and a second ring beyond the middle. Anterior tarsi black on the first, short joint, at the base of the second and at the tips of the second, third and fourth joints; the hind tarsi have the same markings with the exception of the base of the second joint, which is not black. Poisers yellowish, the base of the knob blackish. Wings yellowish, appearing almost golden yellow in an oblique direction, with bright spots of a violet reflection. Before the second longitudinal vein there are two such spots, the first immediately beyond the tip of the first longitudinal vein, the second between the first and the tip of the second longitudinal vein. Between the second and third longitudinal veins there are three violet spots, the first of which is the largest; it is situated under the first costal spot and runs far towards the base of the wing in the form of a wedge without sharp limitation; the second is the smallest, and is placed below the yellowish space between the two costal spots; the third is a double spot almost S shaped, and united to the second costal spot with its anterior end. Behind the third longitudinal vein the violet color prevails to such an extent as to leave only two golden spots, one of which is placed behind the anterior branch and the other immediately behind the posterior branch of the third longitudinal vein. The cilia of the wings are quite pale yellowish, but blackish where the violet spots reach the margin of the wing.

Hab. Washington. (Osten-Sacken.)

This species resembles very much the European *Diplosis pavonina* Loew, but is easily distinguished from it by the smaller extent of the violet color of the wings, the smaller extent of the black color of the legs, and the sharper limitation of both colors. Whether the male of *Diplosis pavonina* has likewise the joints of the antennæ alternately dark-colored I do not know, as I did not succeed in discovering it; judging, however, by the appearance of the antennæ of the female, this does not seem to be the case."

II. Galls or larvæ known, perfect insect unknown. (The description of these galls and larvæ is given below, under the indicated numbers.)

On hickories, *Carya*, of different kinds, seven species, besides one belonging to the third category. (Nos. 1—8.)

On the golden-rod, *Solidago*, of different kinds, two species, besides other two belonging to the third category. (Nos. 9—12.)

On *Vaccinium* (or *Gaylussacia ?*), one species. (No. 13.)

On the scrub pine (*Pinus inops*), two species. (Nos. 14 and 15.)

On the red maple (*Acer rubrum*), one species. (No. 17.)

On the ash (*Fraxinus americana*), one species. (No. 18.)

On the oaks of different kinds (*Quercus*), four species. (Nos. 19—22.)

On the wild grape (*Vitis*), one species (No. 24), besides another belonging to the third category.

On the hornbeam (*Carpinus americana*) one species. (No. 25.)

On the tulip-tree (*Liriodendron tulipiferum*), two species. (Nos. 26 and 27.)

On the willow (*Salix*), one species (No. 28), besides one belonging to the third category.

On *Impatiens fulva*, one species. (No. 30.)

On the blackberry (*Rubus villosus*), one species. (No. 31.)

On *Agrostis lateriflora* (?), one species. (No. 32.)

III. Perfect insect described, and its habits known.

On the cereals (wheat, rye, etc.).

C. destructor Say. *C. tritici* Kirby.	About the habits of these well-known insects, see Dr. Harris's Treatise, etc., and Dr. Fitch's papers: The Hessian Fly (Trans. N. Y. State Agric. Soc., vol. VI), and The Wheat Fly (ibid. vol. V).

C. culmicola Morris. See Dr. Harris's Treatise, p. 465.

On the locust (*Robinia pseudoacacia*).

C. robiniæ Hald. Amer. Journ. Agric. and Sc., vol. VI, 193. Harris, Treatise, etc., p. 452. (Haldeman's paper is also reproduced in the Proc. Boston Soc. of Nat. Hist., vol. VI, January, 1859.) The larva lives upon the leaves, the margins of which it deforms into a roll. It is evident, from Mr. H.'s description of the perfect insect, that it belongs to the sub-genus *Diplosis*. (See also Fitch, Reports, vol. II, No. 332.)

C. pseudoacaciæ Fitch, Reports, vol. II, No. 331. The larvæ injure the tender young leaflets near the tip of the stem, causing them to be folded like a little pod (in July and August). They transform under ground.

On the gooseberry (*Ribes uva crispa*).

C. grossulariæ Fitch, Reports, vol. I, p. 176, and vol. II, No. 150. The berries turning red prematurely and becoming putrid, contain the bright yellow larvæ. Dr. Loew thinks that the perfect insect belongs to the sub-genus *Asphondylia*. (See p. 7.)

On the willow (*Salix rigida* and *S. lucida*).

C. salicis Fitch, Am. Quart. Journ. Agric. and Science, vol. I, p. 263. (See also Dr. Harris's paper in Proc. Bost. Soc. Nat. Hist., vol. VII, January, 1860.) The gall is a woody tumor, surrounded by the dry and brittle terminal bud, at the tips of the twigs. It contains but a single larva. The name of the species must be changed, as there is already a European *C. salicis*. I propose to call it *C. rigidæ*.

On the alder (*Alnus serrulata*).

C. serrulatæ O. S. (See below, No. 16.)

On the hickory (*Carya*).

Diplosis caryæ O. S. (See No. 1.)

On the wild grape.

Lasioptera vitis O. S. (See No. 23.)
On the golden rod (*Solidago*).
C. solidaginis Lw. (See No. 9.)
C. hirtipes O. S. (See No. 10.)
On *Chrysopsis mariana.*
C. chrysopsidis Lw. (See No. 29.)

In comparing this list with similar enumerations existing for European *Cecidomyiæ*, but few cases of analogy will be found. Such cases are, for instance, the habits of *C. pini inopis*, nov. sp., which correspond exactly to the European *C. pini* Degeer; the gall of *C. strobiloïdes*, nov. sp., on the willow, which is represented in Europe by *C. strobilana* Bremi; the analogy between the gall on *Fraxinus americana* (No. 18) and that of *C. botularia* Wz. of the European ash, is more doubtful; likewise that between the deformation of *C. erubescens*, nov. sp. (No. 20) on the oak leaves, and a similar deformation described by Mr. Loew (*C. quercus* Lw.)

Two galls occur on the American wild grape, whereas none has been discovered on the European grape; likewise, although eight galls are already known to occur on the hickory (*Carya*), none is recorded as belonging to the European walnut (*Juglans*). Although galls have been found on the European maple, alder, and blackberry, they are different from those recorded below on the American species of these trees and shrubs. *Robinia, Liriodendron*, and in some degree *Solidago*, being peculiar to America, their galls could not, of course, be expected to be found in Europe.

I will proceed now to give a condensed description of the observations which I had occasion to make on *Cecidomyiæ* during my residence in this country. These observations were made in the environs of Washington, unless otherwise mentioned. I have followed a practice adopted in Europe, in giving names to species known only on account of the deformations they produce, the perfect insect not having as yet been reared. This affords the advantage of being able to designate each described gall by a fixed name. In order, however, to distinguish such species from those the gall-fly of which has been reared and described, the first are simply put down as new species (n. sp.), whereas the names of the authors have been mentioned after the specific names of the latter (Lw. or O S.)

1–8. On hickories (*Carya*) of different kinds.

The numerous galls of *Cecidomyiæ* occurring on the hickory are found indifferently on the various species of this tree. I have noticed also that whenever a spot is found where one of the galls occurs in abundance, some of the other kinds are sure to be found. Thus the galls of *Cec. holotricha* and those of *Diplosis caryæ*, or those of the latter with the galls of *Cec. tubicola* are frequently met with on the same leaflet.

These galls may be distributed as follows (the numbers from 1 to 8 corresponding to those of the descriptions given below): A. True galls, fastened to the under side of the leaf and breaking off easily. *a.* Bare. 1. *Subglobular*, with a small nipple at the tip, diam. 0.05 to 0.1. 2. *Elongated onion shaped*, a little larger than the preceding. 3. *Conical*, contracted at base, blood red or purplish. 4. *Cylindrical*, erect, inserted in a cylindrical socket. *b.* Pubescent. 5. Subglobular, with a nipple at tip (or short onion shaped), pubescent with ferruginous. 6. Subglobular, without nipple at tip, finely downy. B. Other deformations. 7. Swelling of the midrib at the base of the leaf. 8. Yellow spots on the leaves; larva living on the leaf, not within it.

1. *Diplosis caryæ* O. S. Gall subglobular, smooth, seedlike, 0.05 to 0.1 in diameter, with a small nipple at the tip. In summer they are yellowish-green and their shell is soft; in winter they become brownish, and the shell, although thin, is hard and woody. They begin to grow in June. I gathered them in October, when the larva was full grown.

Each gall contains a single larva; it is white, and stouter in proportion to its length than most larvæ of *Cecidomyia*. The breast-bone has two sharp points anteriorly, with an excavation between them; the tip of the last abdominal segment has no horny processes. It undergoes the transformation within the gall. The pupa resembles, by the structure of its head, that of *C. sarothamni* Wz., figured by Mr. Winnertz in his monograph (*l. c.* tab. I, f. 6); namely, the pointed projections at the basis of the antennæ are closely approximated and not remote, as in other species.

After having kept these galls on moist sand all winter, I obtained the fly in April. (Description drawn from a fresh specimen.)

D. caryæ O. S. ♂ and ♀.—Antennæ pale; ♂ 26-jointed; alternate joints a little larger than the intermediate ones; verticils moderate; pedicels between the joints rather short; ♀ 14-jointed, joints subsessile; front and mouth pale; collare with a blackish edge posteriorly, ending on both sides in a short, black streak on the pleuræ; thorax pale, with three broad, almost contiguous blackish or grayish stripes; the intermediate one is subcuneiform and slightly capillary towards its posterior end, which, for this reason, appears slightly bifid; it does not reach the scutellum; the lateral ones are rounded anteriorly, narrowed posteriorly, and end just before the scutellum in a short, black streak, communicating with a brown triangle on the side of the scutellum, so that the latter, being pale itself, is inclosed on both sides by the black streaks and the brown triangles; a couple of black dots are visible on the pleuræ; a pale brown spot on the pectus, between the first and the second pair of coxæ; a brown spot at the basis of the halteres, which are pale; abdomen reddish, hardly darker laterally, and with a tuft of hair on each side, near the posterior margins of the segments; legs pale, with a minute, appressed black pubescence, which makes them appear blackish; wings immaculate; the second longitudinal vein joins the costal at the apex of the wing or immediately beyond it; cross-vein indistinct or none.

2. *C. caryæcola*, n. sp. Gall somewhat larger than the preceding, elongated onion-shaped, with the tip prolonged in a point, pale green. Found through the summer either in separate clusters, or mixed with other galls, for instance that of *C. holotricha.*

3. *C. sanguinolenta*, n. sp. Gall conical, narrowed at the basis, blood red or purplish, about 0.15 high and 0.12 broad. I found them for the first time about the middle of July. At this time they were solid inside, except a narrow hollow near the basis which contained the small, somewhat yellowish larva, with a distinct, pointed, spear-shaped breast bone. These galls occur in numerous clusters on the same leaflet.

4. *C. tubicola*, n. sp. Gall narrow-cylindrical, erect, about 0.15 or more long. They break off easily, being inserted in a small protuberance on the leaf, with a sharp-edged socket in the centre, in which the cylinder fits exactly. Their color, when ripe, is more or less brownish, pale greenish at base. They are hollow inside and contain in October a whitish larva with a breast bone ending anteriorly in a single, elongated point. They generally occur in clusters. Some of these galls are found covered with a viscous fluid.

Early in summer I frequently found a gall of the same form, but smaller, generally reddish at the tip and easily distinguished by the absence of the basal piece in which the other is inserted; it is simply fastened to the leaf by a minute pedicel. Besides, it occurs always singly, frequently on the edges of the leaves, whereas the other gall is for the most part found in clusters. Is it the same species?

5. *C. holotricha*, n. sp. Subglobular, pubescent, onion-shaped galls. Diam. up to 0.1 or a little more.

They resemble the galls of *D. caryæ* in shape, but are somewhat larger and covered with a pubescence which is pale when the gall is young and growing, and becomes rust-colored in the stage of ripeness. I have observed two modes of occurrence of these galls; either they are scattered in numbers, as many as a hundred on the same leaflet, or they grow in a row along the mid-rib of the leaflet; in the latter case they are generally larger, and being packed close together, assume an irregular shape. It is very probable that these two forms belong to two different species, and in this case I would retain the above name to the first form. Galls of the first form begin to grow in June; in September and October I found the white larva apparently full grown. The breast-bone has one elongated point anteriorly and two projections on both sides, about the middle. At the same time I find in my diary that in some of these galls (it is not distinctly stated which), I had found a *pale orange*, apparently full grown larva, with the breast-bone ending anteriorly in two triangular points with a rectangular excision between them.

6. *C. persicoïdes*, n. sp. Gall round, 0.1 to 0.2 in diameter, smooth, without nipple-shaped tip, yellowish or red, clothed with a delicate down like that of peach, and looking somewhat like a diminutive fruit of this kind. I found these galls more seldom than the others.

7. *C. cynipsea*, n. sp. Rounded, irregular, hard swelling on the under side of the hickory-leaf, on the midrib, near the base of the leaf, about half an inch long. When I found it (in July) it was pale yellowish, and contained, in several small hollows, minute whitish larvæ, with a breast-bone narrowed anteriorly and ending in a point.

8. *C. glutinosa*, n. sp. The small yellowish-orange larva forms no gall, but lives in the open air on the under-side of the leaf, to which it is attached by a viscous substance probably secreted by

the leaf. The presence of the larva is indicated on the other side of the leaf by a round yellow spot. The structure of the larva is peculiar: it has rows of fleshy, pointed tubercles along its back, like the larva of *C. pini inopis* (described below), with which it agrees in some respects in its habit of fastening itself to the surface of the leaf by means of a viscous substance.

9. *C. solidaginis* Lw. Gall on *Solidago* produced by the arrest of the growth of the stalk, which causes the leaves to accumulate round the same spot and thus to produce a large imbricated deformation. It begins to appear already in July, but the flies escape only late in the fall. The following description of gall and fly have been prepared by Mr. Loew:—

"The gall (Tab. I, fig. 8) represents a globular head of the size of 1½ to 2 inches formed by hundreds of leaves, the exterior ones being only little altered, the interior ones becoming more and more narrow; on a closer examination we easily perceive that this structure results from the coalescence of several deformations at the tips of abortive twigs; in a specimen which I dissected I counted five such shortened twigs. At the top of each twig there is a single gall, without compartment, somewhat of the shape of a very small seed, and having in its interior a cavity widened a little underneath. The tip of one of them (Tab. I, fig. 10) showed at its end three small convergent lobes, giving it the appearance of being produced by three coalescent leaves. I could not discover this structure in the others; I found only a rounded, rather irregular opening at the tip. The insect which produces this deformation likewise belongs to the genus *Cecidomyia* in the restricted sense.

C. solidaginis Loew. ♂ and ♀. (Tab. I, fig. 4—7.)—**Fusca, abdomine fasciis rufis et nigris picto; antennarum flagellum in mare articulis 20 vel 21, in feminâ circiter 18; alæ pilosæ, nigricantes, venulâ transversa nullâ; terebra feminæ modice elongata.**

Fuscous, abdomen with black and red bands; flagellum of the antennæ with 20 or 21 joints in the male, with about 18 in the female; wings hairy, blackish, without transverse veinlet; borer of the female moderately long. Long. corp. ♂ 0.16, ♀ 0.17. Long. al. ♂ and ♀ 0.16—0.17.

Thorax with the pleuræ sometimes brown, sometimes dark fuscous, with black hairs. Abdomen of the female with distinct black and red transverse bands, the latter less distinct in the male; hairs of the abdomen blackish with a lighter reflection. Antennæ of the male with 20 or 21 brown flagellar joints with rather long peduncles, the uppermost being much smaller than the preceding; the verticillate hairs very long and rather light. The female has generally some flagellar joints less, and its joints are round, with shorter hairs and without any peduncle. The female ovipositor has a very moderate length and is little pointed. Legs of the female black without white reflection. Legs of the male much longer and more slender than those of the female; hind tibiæ and tarsi everywhere with a white reflection, which, on the fore and middle tibiæ and tarsi, is chiefly seen on the under side. Poisers black. Wings blackish on account of their close and long hairs; between the first and second longitudinal veins no transverse vein is visible; the second longitudinal vein towards its end is very little curved exteriorly; the anterior branch of the third longitudinal vein is distinct and nearly straight." (Description drawn from dry specimens.)

10. *C. hirtipes* O. S. Rounded gall at the tip of stunted stalks of *Solidago*, sometimes nearly an inch in diameter, smooth, brownish on the outside, solid inside, containing several larvæ in different compartments. I found them in August, and obtained the fly on the 17th of September.

C. hirtipes O. S. ♀.—Antennæ reddish-black, 22-jointed, joints short, subcylindrical, almost subglobular, gradually decreasing in size towards the tip, separated by pedicels which are shorter than the joints, verticillate-pilose; head dark reddish with black hairs on the vertex; eyes contiguous on the front; thorax blood-red, its back blackish, the usual three stripes being almost coalescent and separated by rows of erect black hairs; collare blackish above; pleuræ blood-red, with indistinct black dots; scutellum and metathorax red, the first with black hairs; halteres reddish at base, the club deep black; abdomen red, upper side of the segments with a blackish, apressed, rather sparse pubescence; coxæ reddish, feet deep black; wings with a dense, blackish pubescence; costa black, especially along its middle portion; second longitudinal vein reaches the margin at or close by the tip of the wing; cross-vein indistinct. (Description drawn from a fresh specimen.)

11. *C. carbonifera*, n. sp. Pale, circular spots, surrounded by

a purplish-black ring, on the leaves of *Solidago;* under each spot, inside of the leaf, several larvæ. I found them commonly in August, and observed that the hollow space within the leaf was frequently filled with a hard, black substance, not unlike charcoal.

12. *C. racemicola*, n. sp. Bud-shaped gall among the racemes of *Solidago*. It has about 0.1 in diameter, is green, and looks exactly like a bud, but is easily distinguished from the buds of *Solidago* by its stout, rounded form. Each gall contains a single reddish larva. Not rare in September.

13. *C. vaccinii*, n. sp. Gall on the leaf of *Vaccinium* (or *Gaylussacia ?*), in the shape of a cock's comb. I found near Washington, in October, one single leaf with two galls of this kind, arising from the central rib. The largest of the galls was about 0.15 high and 0.2 broad about the middle. They were green, and resembled pretty much a cock's comb, or, still better, an oyster, fastened by its hinge. After having been kept for some time on moist sand, both burst open exactly like the valves of a shell, and a reddish larva escaped from each. Both wandered for some days in the bottle in which I kept them, and inclosed themselves afterwards in delicate semitransparent cocoons, formed above the surface of the sand, between some chips of paper which I had provided for them. Unfortunately, both died without undergoing their final transformation.

14. *C. pini inopis*, n. sp. Resinous cocoon on the leaves of the scrub pine (*Pinus inops*). Similar cocoons have been observed on the European pine, and described a century ago by Degeer. Ratzeburg, in his *Forst-Insecten*, describes and figures the same cocoon, as well as the larva and the perfect insect, *C. pini* Deg.* Dufour (in the Ann. Soc. Entomol. de France, 1838, p. 293) gives an account of a *Cecidomyia* with precisely similar habits, which he observed on the South European pine (*Pinus maritima*), and which he called *C. pini maritimæ*.

The larva producing these cocoons is remarkable for two rows of oblong, pointed, fleshy protuberances along its back, and a similar row on each side. (See Ratzeburg, Forst-Insecten, III, Tab. x, f. 14, L.) Early in April I saw some of these larvæ emerge from a small hollow between two terminal buds, where they had probably spent the winter, and crawl along the leaves, aided in this by a resinous substance which they exuded abundantly. Having reached a certain height on the leaf, they stop and remain quiet till the resinous substance covering them becomes hard and assumes the shape of an oblong, whitish, semi-transparent cocoon. Then the larva may be seen moving to and fro inside of this cocoon. I did not succeed to rear the fly from the cocoons which I brought home, and when I returned to the same spot in the woods about a month later, the cocoons were already empty.

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* See the same figures of cocoon and larva in Wiegm. Archiv, etc., vol. VII, p. 233.

According to Ratzeburg's statement the European species spends the winter in the cocoon. The American species, as just shown, forms its cocoon only in the spring. As, nevertheless, it may be identical, or at least closely allied to *C. pini* Degeer, I subjoin here the description of the latter, translated from Mr. Winnertz's monograph. (Compare also Ratzeb. l. c. III, p. 159.)

C. (Diplosis) pini Degeer. ♂ Antennæ somewhat longer than the body, brown, basal joints yellow, verticils snow-white; joints strong, stout, on short pedicels, double joints three times as long as the pedicel, the last joint with a very small, nipple-shaped projection; hypostoma and front pale reddish or brown; palpi reddish-yellow; thorax brownish-black or black, with two rows of white hairs from the collare to the scutellum, and one row from the shoulder to the origin of the wing; pectus blackish; pleuræ reddish-brown; halteres white; abdomen reddish-brown, with white hair, forceps blackish; feet brown with white articulations, under side silvery-white; posterior feet with a silvery-white reflection when viewed in a certain light; wings milky white, with a white pubescence, the costal and the two first longitudinal veins brown, the third longitudinal vein pale; transverse vein pale, but distinct, very oblique, situated a very short distance beyond the middle of the first longitudinal vein; third longitudinal vein straight, turning towards the posterior margin in an obtuse, rounded angle; the second longitudinal meets the costal immediately beyond the tip of the wing.

♀ Antennæ a little more than half as long as the body, brown with gray verticils, basal joints yellow; joints of the flagellum about five times as long as the pedicel, last joint ending in a small bud-shaped appendage; hypostoma reddish-yellow; front reddish-brown; palpi and thorax as in ♂; halteres brown; abdomen reddish-brown, with short whitish hairs, more dense and with a silvery reflection laterally; ovipositor short, yellow, with two small oval lamels; femora and tibiæ and the anterior pair of tarsi superiorly black or black-brown; inferiorly white with a silvery reflection; the posterior tarsi have the two basal joints black or black-brown superiorly, silvery white inferiorly; the three last joints are silvery white, sometimes with blackish articulations; wings gray, iridescent with a dense, blackish-brown pubescence and brown veins; cross-vein distinct, very oblique, situated a little before the middle of the first longitudinal vein; second longitudinal as in ♂, the third likewise, although almost perpendicular to the posterior margin. Length ♂ ♀ 0.1 to 0.15.

15. *C. brachynteroides*, n. sp. Swelling at the basis of the leaves of the scrub pine (***Pinus inops***). In consequence of this swelling the pairy leaves diverge, their bases coalesce, and the sheath at the basis of the bunch bursts. In July these swellings contain several small reddish larvæ; in winter I found them empty, but having observed some larvæ hanging on cobwebs near these galls, I conclude that they undergo their transformation under ground, and were caught in these cobwebs in the attempt to leave the gall.

The habits of this Cecidomyia seem to be very like those of *C. brachyntera* Schwägr. living at the base of the pairy leaves of the European ***Pinus sylvestris***. Still, the latter produces no gall or swelling whatever, and causes the leaves only to wither; it also goes under ground for transformation. (See Ratzeburg, Forst-Insecten, Vol. III, p. 160.)

16. *C. serrulatæ* O. S. Deformed terminal buds of the common alder (***Alnus serrulata***).

The buds appear enlarged, rounded, pointed at the tip, having from three to five lines in diameter. In autumn they are greenish; in winter withered, brown, and frequently covered with a whitish efflorescence. Each gall contained in October from two to six reddish larvæ, lodged in the same compartment. In winter the galls are found empty, as the larvæ go under ground. By keeping some of these galls, gathered in October, on moist earth, I obtained the fly in the following April. It belongs to the sub-genus *Cecidomyia* Loew. The description has been drawn from fresh specimens.

C. serrulatæ O. S. ♂ and ♀.—Head and antennæ brownish; mouth and palpi paler; antennæ 18-jointed in both sexes; joints verticillate and on moderately long pedicels (♂); subcylindrical, subsessile (♀); thorax blackish superiorly, the usual three stripes being coalescent; their intervals are indicated only by longitudinal crests of erect hairs; a reddish spot before the scutellum; the latter brownish with two black streaks at the basis; sternum brownish; the rest of the thorax, as well as the abdomen, are of a bright red, especially in the ♀, where this red color is more apparent, the abdomen being so much more distended; dorsal segments of the abdomen brown (which color is produced by numerous and exceedingly minute scales, appressed to the body); stem of halteres pale, knob obscurer; basal half of femora pale; their apical half, tibiæ and tarsi brownish; wings margined with a brown pubescence anteriorly and round the apex, especially in the ♀; cross-vein not apparent; the second longitudinal vein reaches the margin a short distance before the apex.

17. *C. ocellaris*, n. sp. Ocelliform, red spots on the leaves of the red maple (*Acer rubrum*). They have about 0.3 in diameter; the margin is bright cherry red, and there is a round patch of the same kind in the centre. The interval between them is pale. They appear brighter on the upper side of the leaf; on the under side in the centre is a small depression occupied by a small, transparent, colorless larva. I found them in this state at the beginning of June. Later in the season I observed that the spots had lost their fresh color, and that the larva had disappeared; I suppose it drops to the ground to undergo its transformation.

18. *C. pellex*, n. sp. Rounded oblong, succulent, subpellucid galls on the ribs of the leaves of the ash (*Fraxinus americana*). Diameter, 0.15 to 0.2. They are pale green, and the more ripe ones are slightly colored with brownish. The principal convexity is on the upper side of the leaf; on the under side the leaf-rib appears swollen, pale green in the middle, and whitish on both sides. Each gall contains a whitish larva; some of these galls were double. There were one or more (as many as six) galls on the same leaf. Towards the end of June I found many of these galls shrivelled and dry, and suppose therefore that the larvæ had gone under ground. A gall apparently similar to this has been discovered on the European ash, and described by Bremi and Winnertz.

19. *C. niveipila*, n. sp. Deformation of oak leaves, consisting of a large fold with a white pubescence on the inside. It begins very early in the spring on the young leaves of the white oak and other kinds of oak. The egg is probably deposited on the upper

surface of the leaf, on one of the ribs. The irritation caused by the larva produces a fold or cavity in the leaf, lined inside with a white pubescence. The under side of the leaf shows on the corresponding spot the swollen rib, which is pale green, bordered on both sides by the same white pubescence. The galls, according to their size, contain more or less larvæ, sometimes ten or more. When this deformation is very large, it involves the whole leaf, which is folded in two along the midrib, the under side forming the outside of the fold, and showing the swollen ribs with the white pubescence in their intervals. On the 25th of May I found some of the galls considerably grown, thick, and swollen; their pubescence was of the brightest white; the larvæ they contained were also grown, plump, white. Other galls, on the contrary, had grown but little, and appeared sickly or withered. They contained no larvæ at all, or their inmates appeared yellowish and sickly. I suppose that some of them were attacked by parasites, as I found a minute hymenopterous larva fastened to the skin of one. In June some of the galls which I brought home were abandoned by their inmates, which went under ground for transformation, but perished soon afterwards.

The larva of this gall is white, and has two small horny processes, directed upwards, at the anal end of the body; its breast bone is truncated, heart-shaped anteriorly.

20. *C. erubescens*, n. sp. Folded margin of an oak leaf, tinged with red. This deformation seems to resemble that of *C. quercus* Lw. on the European oaks. Occurs in the spring.

21. *C. symmetrica*, n. sp. Hard red gall on the leaves of different kinds of oak, small and round (between 0.05 and 0.1 in diameter) when single, but more commonly assuming an irregular shape by the coalescence of a number of them.

I find them chiefly and in large numbers on leaves of *Quercus falcata* in autumn. They sometimes invade almost the whole surface of the leaf, and have exactly the same size and shape on both its sides. The single round galls contain one larva, the compound ones a number of them, depending on the size of the gall, but each in its own compartment. The red substance of the crust shows many cracks, when the gall is ripe, and is easily detached. . Under it is a harder, almost woody, yellowish substance. When the dry leaves with such galls fall to the ground, the red part of the crust generally crumbles away in part, partly it is found erect, forming a jagged fence round the gall. Such galls are generally empty, the larvæ having perhaps gone under ground, although one of the specimens which I brought home was inclosed in a delicate cocoon inside of the gall.

The larva is reddish, and has the usual breast-bone with a deep excision in the middle anteriorly; the two lobes thus formed are rounded.

These galls, as I remarked before, protrude symmetrically on both sides of the leaf. On other kinds of oak, especially the quercitron oak (*Q. tinctoria*), I found similar galls, but on the upper side of the leaf only, without the corresponding excrescence on the under side. Those I brought home were abandoned by their larvæ, which went under ground. Thus I am very uncertain about the identity of both galls, as well as about the habits of the insects. As all these galls were found with larvæ late in autumn, it is evident that the fly escapes very early in the spring.

22. *C. poculum*, n. sp. The so-called *oak spangles* (Fitch, Rep., vol. II, No. 40), small, circular, somewhat saucer-shaped scales, from 0.1 to 0.2 in diameter, reddish or purplish, covered with a white efflorescence, attached to the leaf by a short pedicel, common in autumn on different kinds of oaks, are generally found empty. In the beginning of August I found a similar gall, yet succulent and greenish, on the post oak (*Q. obtusiloba*), and inside of it a small whitish larva having all the appearance of the larva of a *Cecidomyia*, although, on account of its minuteness, I did not succeed in discovering the breast-bone.

Dr. Fitch is in error when he states that these galls are "perfectly the same" as those noticed by Westwood, Introd., II, p. 130. The European galls of this kind are pilose externally, as stated by Westwood and figured by Réaumur (Mém., vol. III, Tab. XL, f. 13); the American ones, at least those which came under my notice, are smooth.

23. *Lasioptera vitis* O. S. Swelling of the stem and leafstalks of the wild grape. This irregular succulent swelling, which becomes red on its stouter and riper portions, extends not only along the stem and leafstalks, but also invades the leaf-ribs. It contains round hollows of about 0.1 in diameter with an orange-yellow larva in each. Some of the hollows are often abandoned by their inmates and invaded by numerous *Thrips*. Having brought this

gall home, I noticed that the larvæ went under ground and obtained the fly on the 29th of June.

L. vitis O. S.—0.04 long, pale reddish, head blackish, antennæ black, apparently 23-jointed, filiform, joints broader than long, sessile, with a short pubescence (they answer exactly Winnertz's figure of the antenna of *L. rubi* Wz., *l. c.* Tab. IV, f. 14), two basal joints yellow, thorax blackish above, with a golden pubescence near the collare and down to the origin of the wings; scutellum pale reddish, abdomen covered superiorly, on each segment, with rows of blackish scales; legs pale reddish, wings with gray pubescence, anterior margin with a black fringe of hairs.

24. *C. viticola*, n. sp. Elongated, conical, red galls, 0.25 to 0.3 long; on the upper side of the leaves of the grape.

On the 16th of July, when I found them, they contained pale orange larvæ, the breast bone of which had two points anteriorly, with several small indentations between them. The tip of the body ended in two curved, horny points, directed upwards.

25. *Cecid. pudibunda*, n. sp. Fold on the leaf of the hornbeam (*Carpinus americana*), tinged with red on the outside. It is generally situated between two of the side ribs, and runs, therefore, obliquely towards the central rib. Inside of this fold I found, on the 15th of June, exceedingly small whitish larvæ; when magnified they appeared semi-transparent, with an orange spot about the middle of the body, and with numerous short, erect bristles; the head is distinct, as well as two short antennæ; although I did not perceive the breast-bone, I have no doubt, from the appearance of these larvæ, that they belong to this genus.

26. *C. liriodendri*, n. sp. Brown spots with a yellow or greenish aureole on the leaves of the tulip-tree (*Liriodendron tulipifera*).

These spots, about 0.2 or 0.3 in diameter, indicate the presence, inside of the leaf, of a leaf-mining larva of *Cecidomyia*. It is about one line long, orange, the exserted portion of the breast bone is truncated heart-shaped; the tip of the body has two short, horny points, directed upwards. (Similar spots on the same tree are produced by a lepidopterous larva.)

27. *C. tulipiferæ*, n. sp. Swelling of the midrib of the leaf of the tulip-tree. One of these swellings, which I found on the 27th of July, contained several pale orange larvæ of *Cecidomyia*. They had two short, erect, horny points at the end of the body;

the protruding portion of the breast-bone consisted of two triangular projections with a triangular excision between them.

28. *C. strobiloïdes*, n. sp. Terminal buds of the willow (the species is not known to me) deformed in the shape of the cone of a pine. This deformation, communicated to me by Mr. Rob. Kennicott, who found them abundantly in northern Illinois, is an inch or more long and contains several reddish larvæ under each scale, so that the total number of the larvæ in one gall is very considerable. A precisely similar gall has been observed by Mr. Bremi on one of the European willows, and is figured in his monograph (Denkschr. d. Schweitz. Ges. für Naturk., Vol. VIII, tab. II) under the name of *Cec. strobilana.* The perfect insect likewise remained unknown to him.

29. *C. chrysopsidis* Lw. The gall (Tab. I, f. 1) occurs in September on *Chrysopsis mariana* and was communicated to me by Prof. Schaeffer in Washington. Gall and fly are described by Mr. Loew as follows:—

"The gall consists of a woollen knob of nearly the form and size of a very small walnut. On the sides there are single projecting leaves, which appear to have undergone no deformation; at the upper end the leaves of the extremity of the shoot seem to be a little shortened. On removing the rather long hairs of the knob, the interior may be observed to consist of a very great number of single galls, which have no compartments, and coalesce here and there. Each of these galls has an obconical form, unless modified in consequence of its coalescence with the neighboring ones; and it is covered exteriorly with hairs growing longer towards the upper end, and resembling the pubescence on the stem and leaves of the plant. In its interior there is a cylindrical smooth cavity, which the perfect insect leaves through a small round opening of the upper end. This opening apparently does not exist during the larva-state of the insect, since together with galls which were furnished with it, and had been abandoned by the perfect insects, I found some which had no opening and contained the imagos dead.

"The small Gall-gnat which produces this deformation belongs to the genus *Cecidomyia* in the restricted sense, and may be called *Cecidomyia chrysopsidis.*"

C. chrysopsidis Loew. ♂ and ♀. (Tab. I, figs. 2 and 3.)—Rufa, thorace fuscano, antennarum in mare articulis 17, in feminâ 15; alæ pilosæ, cinereæ, venulâ transversâ nullâ; terebra feminæ longissima.

Red, thorax fuscous; flagellum of the antennæ 17-jointed in the male, 15-jointed in the female; wings hairy, cinereous; no transverse veinlet; the borer of the female very long. Long. corp. ♂ 0.1, ♀ 0.14. Long. al. ♂ and ♀ 0.13.

Red, on the upper part of the thorax fuscous, with very short hairs. Pleuræ with brown spots. Abdomen with indistinct brown bands. The hairs of the abdomen very short, appearing light-colored. Antennæ of the male with seventeen (the right-hand side antenna of one specimen with eighteen) joints of the flagellum; joints on moderately long peduncles; the two last are usually welded together; the verticillate hairs on them are very long and rather light. The female generally has two flagellar joints less, and they are rounder, with shorter hairs and without any peduncle. Legs dark fuscous, in some directions with a bright sericeous reflection; tips of the knees whitish. Poisers very pale, with the knob almost whitish. Wings rather dark gray on account of their close pubescence; between the first and second longitudinal veins no transverse vein is apparent; the second longitudinal vein, towards its end, is very little arcuated exteriorly. The anterior branch of the third longitudinal vein is rather indistinct." (Description drawn from dry specimens.)

30. *C. impatientis*, n. sp. Succulent swelling at the base of the flower of *Impatiens fulva*, in September; contains red larvæ. (Communicated to me by Prof. Schaeffer.)

31. *C. farinosa*, n. sp. Rounded woody swelling at the base of the leaflets or on the midrib of the common blackberry; contains red larvæ.

32. *C. agrostis*, n. sp. Mentioned in Dr. Fitch's paper: The Hessian Fly, etc. (Trans. N. Y. State Agric. Soc., Vol. VI), on p. 38 of the second edition, in pamphlet form, in a note which I reproduce here: "I doubt whether the Hessian fly will continue to be the sole member of this genus having a coarctate pupa. Quite recently a species has occurred to my notice analogous to the Hessian fly flaxseed in every point that I have been able to detect, except that its larva-case is of a pale brown color, untinged with rufous or castaneous. It infests the *Agrostis lateriflora?* numbers dwelling together in an imbricated gall, somewhat resembling

the fertile aments of the hop, though larger, and connected with the main stalk by a short pedicel which is inserted into one of the lowest joints of the culm. From the coriaceous texture of the larva case, I suspect the inclosed worm will not leave it until transformed to a pupa and upon the point of evolving the perfect fly." It deserves to be noticed that *Cecid. graminicola*, discovered by Kaltenbach (Winnertz, l. c. p. 292), having precisely similar habits, forms an apparently analogous gall, likewise on a herbaceous plant, *Poa nemoralis.*

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ADDITIONS AND CORRECTIONS.[1]

Page 2, line 2 from the bottom, for *of the* Bibionidæ read *of some* Bibionidæ. (Loew.)

Page 4, lines 2 and 5 from top, for *Stratiomydæ* read *Stratiomyidæ*.

" 5, line 9 from the bottom should read thus: South. *Corethra* is represented in N. A. by *C. punctipennis* Say. (Loew.)

Page 6, line 6 from top, for *Culiocides* read *Culicoides*.

" 12, " 9 from bottom, strike out the first *and*.

" 16, " 4 from top, for *Therevidæ* read *Thereuidæ*.

" 16, " 15 " for *ending* read *end*.

" 18, " 18 from bottom, *Pachygastrina* should be in small capitals.

" 21, " 15 from top, for *Exelasis* read *Exetasis*.

" 21, " 9 from bottom, the word *varying* does not express exactly the intended meaning, which was that of the German words *geschweift*, *geschwungen*. (Loew.) I find, in Say's Terminology, this structure expressed by the words *repand*, *wavy*, which means *with alternate segments of circles and intervening angles*.—O. S.

Page 22, line 11 from top; same remark.

" 24, " 5 " for *Philodicus* read *Philonicus*.

25, " 11 from bottom, for *Usio* read *Usia*.

" 25, " 10 " for *Pleas* read *Ploas*.

" 25, " 5 " for *Autonia* read *Antonia*.

" 26, " 23 from top, for *Brachipalpus* read *Brachypalpus*.

" 27, " 9 from bottom, for *Stratiomydæ* read *Stratiomyidæ*.

" 27, " 8 " for *Dolichopidæ* read *Dolichopodidæ*.

" 27, " 17 " for *Stachinia* read *Stachynia*.

" 28, " 11 from top, for *Neurophocerus* read *Nephrocerus*.

" 36, " 9 from bottom, for *less* read *more*. (Loew.)

" 37, " 18 from top, for *Schoenomyza* read *Blepharoptera*. (Loew.)

" 50, lines 16 and 17 from top, for the words *and for crowding them* read *while the rest remain crowded*, etc. (Loew.)

Page 64, lines 3 and 5 from top, for *curvature* read *concavity*.

" 70, *Tryp. unicolor*; add *Cuba* to its habitat. (Loew.)

" 74, line 7 from top, for *Cederli* read *Cederh*.

" 78, " 1 " for *exceeds* read *reaches into*. (Loew.)

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[1] Many of the corrections have been communicated by Mr. Loew, to whom the signatures were sent; his name, however, has been mentioned after those only which are not readily understood, but require an especial authority.—O. S.

FURTHER ADDITIONS AND CORRECTIONS.

Page 11, line 4 from bottom, after the word *together* add *whiplash-shaped.*
" 11, " 2 " for *second* read *first.*
" 11, bottom line, for *first longitudinal* read *auxiliary.*
" 38, line 17 from bottom, for *short* read *long.*
" 63, lines 17 and 18 from bottom, for *seam* read *margin.*
" 111, line 4 from top, after the word *perpendicular* add *Hab. Middle States.* (*Osten-Sacken.*)

Page 84, *Tryp. solaris:* Wiedemann's and Winthem's collections possess this species from Brazil. (Loew.)

Page 94. Note to *Tryp. comma.*—One of my specimens from Maryland was compared by Mr. Loew with Wiedemann's original and found identical. The latter is a very pale specimen. It seems, therefore, that the elongated hyaline spot at the tip of the sixth longitudinal vein is of normal occurrence in this species.—O. S.

Page 115, line 8 from top, for *femoræ* read *femora.*

" 135, " 6 from bottom, for the words in brackets put *of the cinereous thorax.* (Loew.)

Page 140, line 5 from top, for *terminal* read *antennal.* (Loew.)

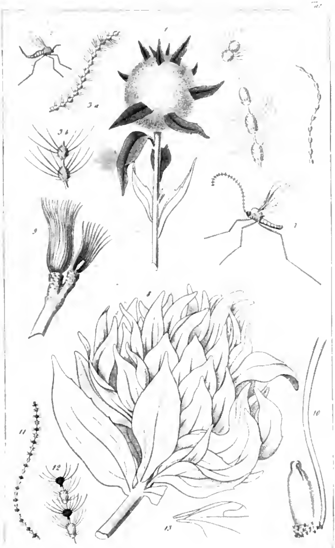
" 142, " 11 " for *steel-colored* read *steel-blue.* (Loew.)

" 144, " 15 " for *knob* read *knobs.*

" 155, " 12 " for *Philhygria* read *Philygria.*

Pages 174, 175. In figures 1–7, the third longitudinal vein is made too strong. Its fork especially is very delicate, sometimes hardly visible in nature, so that the difference between the wings represented on figures 3 and 4 (*Colpodia* and *Epidosis*), the one with, the other without, fork, is not at all so striking as appears in the wood-cuts.—O. S.

In the Index, *Autonia* should be read *Antonia*, and removed to its proper place accordingly, and *Blepharoptera* and *Philonicus* are to be added; and, on page 208, the word *destructor* (Cecidemyia) should be removed to the left, so as to be in the same line with the other specific names.



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